

BUSINESS PLANNING SERVICES

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Unilever Computer Services Limited

NEWS IN BRIEF

Leipzig debut for Robotron virtual machine

THE first virtual memory computer from Eastern Europe is expected to be unveiled at next year's Leipzig Fair by the East German organisation Robotron which hopes to get 100 Megabyte disc drives from the West. As expected (CW, April 14) the machine will be the 1055 mainframe. This is the largest member of the East European unified range (Riad).

This information was given to a US government export control committee by Robert Koehn, a systems strategy consultant at Control Data.

Taxmen scrap plan

THE Inland Revenue has abandoned its plans to set up an ICL 2870 installation at Bootle, Merseyside. This location, where the completion of the data processing centre has been dogged for several years by industrial disputes (CW, October 2, 1975), was one of three earmarked by the Inland Revenue for PAYE processing.

IBM split

US sources say that IBM is planning to split the office products division of its general business group into two divisions: office products involving stand-alone products like typewriters; and office systems taking in products like the System 8 word-processor.

NRDC profits

PRE-TAX profit of £10.82m for the year ended March 31, 1977, against £3.73m for the previous year, has been announced by the National Research Development Corporation.

CORAL 66 for PDP-11

The CORAL 66 compiler for the PDP-11 developed at the Royal Military College of Science is available under license.

The Compiler has been rigorously tested and is offered with full maintenance and support. IECCA confirm that the compiler complies with the Official Definition. Available IECCA benchmark results show this compiler to be 4.72 times faster on compilation, 22% less code instructions and 54% improvement in code generation efficiency when compared, on similar computers, with the other commercially available CORAL 66 compiler for the PDP-11.

The RMCS CORAL 66 compiler is designed to be used for real-time programs. It produces relocatable re-entrant code. All procedures may be used recursively and identifiers used before declaration. The compiler contains a standard I/O library. Among support features is a set of Real-Time primitives, allowing procedures to be run in parallel processes, and include queue and buffer handling, dijstra and semaphores, process scheduling, time slicing and asynchronous device control. Optionally the compiler can compile to PAL Assembler or, if the in-line code facility is not used, to executable binary code.

The compiler can be used with DOS, RT11, RSX and IAS operating systems.

An information document is available on request. This is intended for computer managers, who may not have considered the advantages of CORAL 66 and the use of this compiler. Maintenance, installation, support and pricing information is given. Demonstrations of the compiler on potential customer computers are welcomed.

IPAS computer language compilers and basic software ensure transportability of source programs, while taking full advantage of computer hardware, and the protection of investment in software.

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COMPUTER WEEKLY

Now micros can emulate a PDP-8

By Martin Banks

A SOFTWARE simulator has been introduced in the US which runs DEC PDP-8 programs on an Intel 8080 or Zilog Z-80.

Called the Simul8or, the system was developed by the Amide Corporation of Massachusetts and could soon be available in Europe.

In the UK, Houdre Computing is negotiating with Amide to become agents. Other agents are being sought throughout Europe.

Requiring a minimum configuration of 12K bytes of read/write memory and a teletype writer terminal, the Simul8or provides almost exact emulation of a PDP-8, except for timing, says Amide co-founder Eric Hahn. Available in two versions, it has a US price of \$20 for the paper tape version, and \$23 cassette version, both of which are produced in Intel hexadecimal format.

Among the features it provides are a virtual software front panel, which allows users to perform all PDP-8 front panel functions from the terminal in software. It also adds some features to the capabilities of the original mini, in that users equipped with an 8080 console can obtain a dynamic display of the PDP-8 data on the console lights, and such functions as single step program running can be carried out.

"Virtually every program written for the PDP-8, with a maximum memory usage of 4K, can be run on microcomputers using the emulator," Hahn stated. "This includes a wide range of commercially available and DEC User Society produced programs, many of which are very reasonably priced." The only exceptions to this are programs written in Pascal and Simul8or Basic.

It does mean, however, that a wide range of

programs written in Algol, Fortran and other high level languages can now be run on a microcomputer.

The main drawback is in operating speed. For software written using an interrupt structure, the emulator is forced to poll all I/O ports in turn, and the operating speed can be anything up to 100 times slower than the microcomputer. Software that does not employ interrupts is considerably faster, but is still about 50 times slower than the original.

Although the initial marketing strategy is aimed primarily at the large US personal computer market, Hahn is also considering the scope available in the small business field.

Possible future projects he is considering include a version of the emulator for the Motorola 6800 and, possibly an emulator for the PDP-11.

Modcomp drops business systems

DECIDING to concentrate its resources in its well-established industrial marketplace, Modcomp has dropped out of the commercial systems business in the US and discontinued the operations of its subsidiary, Modcomp Business Systems of Lexington, Massachusetts.

This was set up only eight months after Modcomp acquired and renamed ECS Information Systems of Lexington, Massachusetts.

2,000 staff strike

ABOUT 2,000 computer staff were involved in Tuesday's half-day strike by members of the Society of Civil and Public Servants. Installations affected included the Swansea Driver Vehicle Licensing Centre, the Customs and Excise Centre at Southend which handles VAT, and the Laces cargo handling system at Heathrow.

The action was in protest against the government's refusal to revive an independent Pay Research Unit (CW, October 20).

According to Campbell Christie, deputy secretary-general of the SCPS, computer centres would be a main target of any further action.

general manager, John Pitt, told Computer Weekly that Modcomp in Europe was deliberately hanging back from actively selling commercial systems until the software and training support implications were fully understood (CW, September 22).

Kenneth Harple scotched rumours that John Lobb, who was made chairman of Modcomp last month, was behind the move to close down Modcomp Business Systems. He pointed out the decision was made before Lobb became chairman.

Modcomp Business Systems currently has a \$1 million contract with Burroughs to supply a distribution software package, and Modcomp says that this will be completed.

Modcomp Business Systems was the smallest of the company's four main marketing divisions. The three remaining divisions in ascending order of importance, are communications, OEM and industrial control and instrumentation.



A DECADE ago, Sir William Barlow (above) was managing director of English Electric Computers. Last week he succeeded Sir William Ryland as chairman of the Post Office.

He believes that the Post Office should be split into separate corporations for post and for telecommunications, as recommended in the Carter Committee report.

"Practically speaking, it is a matter of years before this could happen, and meanwhile I am concerned with achieving the maximum amount of decentralisation within each of the businesses. The post, telecommunications, data processing services and civil run as separate units with their own managing directors and I want to strengthen that kind of structure," he said.

Sir William Barlow joined the Post Office from the chairman of half-bearing makers Ransome Hoffman and Pollard.

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COMPUTER WEEKLY

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Lloyds put IBM lease at risk

LEASING companies are taking a risk following a decision by Lloyds to suspend temporarily payments to IBM for the lease of its mainframe computers.

The escape clause enables Lloyds to back out of its agreement after three years instead of the original term of, typically, seven years.

Leasing companies all over the world provide the customer with a choice of equipment and Lloyds writers insure them against being invoked.

This could happen if a modern machine super-price/performance becomes available and the Lloyds writers are currently arguing whether the recent, announced 3031 and 3033, should be in plentiful supply or on 370 agreements, with effect on 370 agreements, now.

A number of leasing companies have made progress to the underwriters to ensure that this risk is kept and industry sources say that the underwriters are some providing coverage next few weeks. If policies are not affected.

Plessey ahead

A STRONG advance is recorded by Plessey in its 1977/78 financial year. The company rose 19% to £21.8m turnover up 10% at £29.5m. UK exports were up 5% overseas business included ports accounted for 5% of total business.

Briefing

Two firms set up Irish plants

A MANUFACTURING, design and software development centre is to be set up in the Dublin area next year by Computer Automation.

It is expected to employ about 400 people. The Irish Development Authority says that CA will initially use existing industrial premises.

Digital Equipment has announced a second plant in Ireland. This will open next year at Clonmel, County Tipperary, and will employ about 100 people within the first year. DEI's existing plant at Galway, opened in 1971, now employs 1,000.

Uncommitted

ALTHOUGH ICL is committed to support any internationally agreed communications protocol standards, such as HDLC and X.25, it is not yet prepared to commit itself to any overall networking philosophy.

Oracle halted

ORACLE, ICL's television information service, has been off the air since the beginning of October due to a shift in pay dispute among members of the Association of Cinematograph and Television Technicians. The service was halted when Oracle was due to begin 13 hour-a-day broadcasts.

Going to schools

A RANGE of packaged systems built round PDP-11 minicomputers has been introduced to the education market by Digital Equipment. The systems range from the ES210/C, a single user machine based on a PDP-11/03 with two floppy discs, to the ES375/W, based on the PDP-11/70 and designed for administrative jobs as well as education.

New BCS group

A SPECIALIST group concerned with the formal aspects of computing science could be set up by the British Computer Society following a meeting at 2pm on November 30 at University College, London. Computer users in general are invited to the meeting.

Chairman resigns

CONSULTANCY and software house Systemsolve has come under the control of BCS's big bureau subsidiary Datasolve with the resignation of the Systemsolve chairman and managing director Richard Holway. Holway's 20% share in Systemsolve has been sold to Datasolve's three executive directors and to Datasolve, which already owned 40%.

Books offer

A NEW special offer is introduced this week exclusively for Computer Weekly readers. Book Input Two-Nine is offering

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COMPUTERVIEW

Success of the Cross
years still to be provedThe final judgment on the reign
of Geoffrey Cross at ICL will
depend more on ICL's performance
in the next few years
than on the successful financial
results of the Cross years.His achievement in turning
ICL into an expanding, profitable
international company is
unquestionable, in terms of the
1972-1977 financial results.But how superficial and
short-term are these results?
How much has depended on
Cross' financial and managerial
ability and how much on a
genuine, sound regeneration of the
whole company?Cross' departure at this time
seemed so unlikely that,
although his concern for his
family's health was an important
factor in his decision, it is
clear that other factors must
have weighed on his mind.His departure took everyone
by surprise because he had just
signed a new five-year contract,
stirring rumours that he felt he
had fulfilled his ambitions at
ICL. Next month, ICL will an-
nounce exceedingly good financial
results, and last week the
2950, a potentially highly suc-
cessful machine, was an-
nounced.Having come through the first
few traumatic and often bitter
years after joining ICL, his
standing within the company
was at its peak.The personal shock with
which so many ICL staff
received the news of Cross'
resignation last Friday was
testimony to the remarkable
effect that he had on the whole
company.And the concern of so many
ICL staff about the effect of his
departure on ICL's share price
also proved that ICL's policy of
selling shares to staff can give a
company a very practical sense
of corporate identity.Cross had also become a
national figure and his name
was continually being men-
tioned when a national post,
such as the head of British
Leyland or British Rail, became
available. There were also con-
tinual rumours that he was be-
ing headhunted by commercial
companies, such as Ford's.The worst that his opponents
said of him was that he was a
short-term financial manipu-
lator, who was boosting ICL's
performance so that he could
have taken up a share option
earlier this year to buy up ICL
shares at an attractive rate. But
those critics seemed to have
been silenced by his recent sign-
ing of the five-year contract.His abrasive management
style also created many enemies,
particularly at middle manage-
ment level where, in his early
days, he rode roughshod and
ruthlessly through any areas
which he felt were not meeting
his overall objectives.His departure at the height
of his public success will give his
critics renewed strength. Whichis why the next year will be
crucial in proving whether
Cross' reputation will stand the
test of time.Why then did he choose this
moment to leave?
The state of his children's
health and his inability to con-
trol labour relations sufficiently
well to turn "excellent" results
into "absolutely superb" ones
were his publicly stated reasons.Yet he was aware of both
these factors when he signed his
five-year contract.Both these factors could,
however, be summarised as dis-
illusionment with Britain,
weatherwise and because the
social system does not accord
with his views of how a modern
capitalist state should be run.Earlier this year he made it
clear that he would like to be
given a free hand in wage ne-
gotiations — provided there was
a fair fight. By fair fight, he
meant that there should be less
"featherbedding" for strikers
and those taking industrial ac-
tion.Between the lines, he was re-
ferring more to this kind of in-
dustrial relations context last
week than to the specific issues
of, say, shop-floor bargaining.He also made no secret of the
fact that he disliked ICL being
thought of as a government-
supported company. He was also
extremely unhappy that ICL's
government links inhibited his
managerial freedom.Earlier this year he made it
crystal clear that he wanted to
take over an American
minicomputer manufacturer. It
is understood that the three he
had in mind were the huge Data
General, Prime, and Harris.But the government and some
unions wanted ICL to be in-
volved with a British or
European manufacturer.Significantly, Cross
commented last Friday that he
hoped that the new managing
director, Dr Chris Wilson, could
bring to ICL "a greater realisation
that the real fight is
against IBM, not ourselves."The statement was made in
the context of his comments on
industrial relations. But there
are still those in ICL — mainly at
management levels — who talk
of the "American influence" and
who see Cross, production and
development director Ed Mack
and "Mr Fix-it" Brian O'Heron
as a kind of mafia brotherhood,
imposing an alien style on the
"old British ICL."As Computerview pointed out
last week, the internecine tech-
nical battles over the B and K
operating systems have not yet
been fully resolved. In these
battles, Cross' backing for the
Ed Mack K-biased philosophy
was a crucial factor in the tech-
nical arguments.Cross' departure could lead to
an inflammation of some of the
fester arguments surround-
ing these software develop-
ments, and possibly to the de-parture of Mack and Brian
O'Heron, who is currently in
charge of producing B and K to
acceptable customer levels.One of Dr Wilson's first tasks
is to keep the 2900 operating
system development on its cur-
rent path of steady improve-
ment.Given complete management
freedom from having to take
into account government
guidelines, a more free-
enterprise society and a stronger
belief in the unity of ICL, Cross
might have stayed for a few
more years.That is now hypothetical.
The facts are that ICL and
Britain have lost a man they
could not afford to lose. Andthat Chris Wilson is faced with
the daunting task of following in
his footsteps.Dr Wilson is, according to
those who have worked with
him, a quiet man, of high intel-
ligence and integrity.His character could be ideally
suited to moving ICL into its
next phase, where corporate
success is visibly seen to be more
important than the charismatic
man at the top.Cross always paid tribute to
those who worked for him. As he
and his family fly off to sunshine
and pastures new, it is ironic
that the best way for his former
staff to say "Thank You, Geoff,"
will be to prove that they can do
very well without him.NOT necessarily all DP man-
agers visiting Compec would
have been made happy — in
particular, those who cling to
the belief that remaining loyal to
their mainframe suppliers is the
name of the computing game.The name of the Compec
game was very much that of
independence with a heavy layer
of OEM overall. Traditional
computer manufacturers in this
environment would have been
as out-of-place as a skateboard
contest held during the rush-
hour in Park Lane. Mainframe
addicts had to be content with
Honeywell which was demon-
strating its Level 6
minicomputer range, and
Univac which had brought
along its intelligent terminals.The term small was, in fact,
limited to the equipment on
display. Certainly not either to
the number of exhibitors or
visitors. This was in direct
contrast to the recent Datafair
and International Business
Show where those present
seemed very much in the limited
category.It so happens that "small" was
also an important finding of a
recent UK survey. With almost
impeccable timing, the presti-
gious Henley Centre for Fore-
casting has presented a survey
looking into life up to the year2002. Although the project does
not specify the role of the data
processing manager in 25 years
time, it does indicate a growing
antipathy towards large scale
organisations. Small units will
increase in importance; large
corporations will increasingly
become partners of the State.Much of the Henley report is
devoted to communication and
computers. Changes apparently
arrive on the scene more quickly
than is generally expected. This,
the survey suggests, is both a
threat and a promise.Looking around Compec,
much of the future seems to be
already with us. Personal com-
puting is but a silicon chip or so
away. At the current rate of
development, our existing pocket
calculators will shortly seem
to be in the Atlas mode.
Mini/micro technology is light
generations away from the IBM
701.For the visiting DPM, Compec
could be worrying. Even so, the
most dedicated "think small" DP
manager must be troubled that
seemingly so many companies
are dependent on his custom for
their existence. This, in fact, is
not always the case.Many exhibitors were present
in the expectation of selling in
bulk to the specialist manufac-
turers or suppliers. Datapro-
ducts, for example, in releasing
its new range of thermal
printers, agreed that its mainmarket — at least at present
will be the mini/micro
suppliers.Other exhibitors
had combined forces. The
hunched Fungus Comput-
ers was in close liai-
son with the abundant fol-
lowing: the Fungus stand
had incorporated the
owls being presented at
the nearby Nashua's
technology gave a good display
"small" can also be
year's presentation was
kitted-out as a classic
DPMs would have been
awarding the gym-nom-
present an A+.Other memory related
cises included the smoo-
nisation of the newly
Bunzl time sharing pro-
viding how a small or
system has more flexi-
the traditional manuf-
time operation. The
released Harris Systems
puter was likewise pro-
small is also smooth —
VM, was online to its
headquarters.A traditional feature of
computer exhibitions is the
power failure — however
and Compec was no excep-
Semaphore Computer
was caught — mil-
demonstrating its
Vanguard minicomputerThe first midnight after the
book-up, the remote machine
received the message, checked
its own clock, saw it was not
midnight, and objected.
The main machine was
stunned and dumped everything
it could think of before attempt-
ing to send the message again.
And all through the night the
machines chatted to each other
and the dump pile grew and
grew.The moral: Check all error
returns, for a blitch in time,
dumps fine.
Submitted by P. P. Bristow, of
Ventura, Plymouth, who wrote this
week's 65 Interrupt page.Ten
years
ago...

COMPUTER WEEKLY

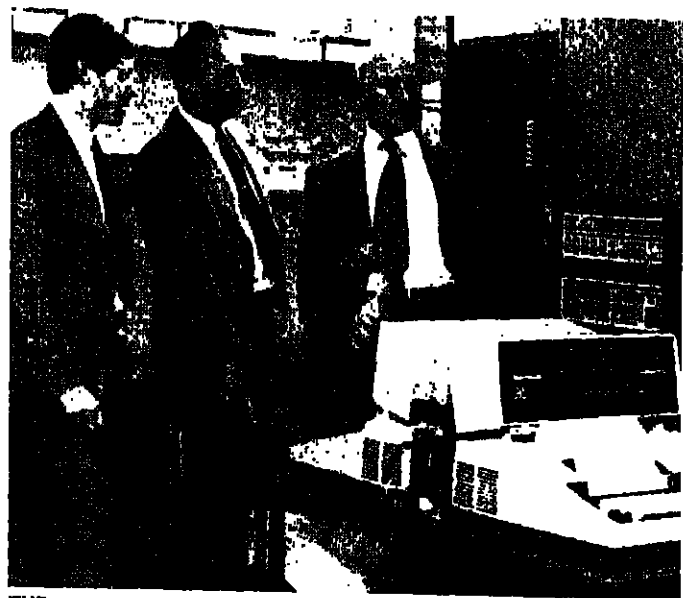
NOVEMBER 16, 1967

EXPORTS OF UK
equipment were up 15 per
cent for the first nine months
of the year... Elliott and
Comptel announced a
long-term collaboration
agreement... The heart of the
transfer scheme is to be
established by the late Dr
Banks, who was to be a
computer science lecturer
at a computer science
department of a
Polish Academy of
Sciences... The transfer
authority planned to
data handling and
business with a new
company called LTI, Ltd,
of "Electronique de la
quas de l'Industrie
Honeywell announced it
Moby mass memory
used a laser to record
stored on a film of tape
and blenuth.ICL gets university
software for 2900sFOUR programming languages and a database
Fortran interface, all developed by universities,
will be available from ICL for its 2900 range within
the next year.The Fortran interface to the IDMS database
management system is being developed at
Edinburgh University on the 2980 run by the
regional computing centre. It will be complete in
1979, but early releases will be made available.Kent University is preparing Basic on its 2980,
running under the VME/K operating system, and
an Algol 68 compiler is being developed for the
2980 run at Bath for the south-western
universities.Two products near fruition are Pascal, which is
coming from Southampton, and a simulation
language, ACSL, being developed at London's

Imperial College.

The products are being developed under the
auspices of the four-man committee of represen-
tatives of ICL and the Department of Education
and Science's Computer Board, which oversees
university computing. The committee was set up a
year ago (CW, October 7, 1976).ICL has invested £300,000 in the projects and the
Computer Board supplies the computer time.
ICL is already selling one product from a
university. This is the Scientific Jobber, developed
at Edinburgh to handle small, fast jobs which do
not need all the facilities of a full operating system
and do not involve a lot of disc access (CW, July 8,
1976).ICL says the product is very popular and is run
by virtually all its scientific users.

Compower enters APL market

ANOTHER bureau service has
ventured into the increasingly
competitive APL market.The latest APL service comes
from the National Coal Board's
subsidiary, Compower. At the
same time, it is approaching two
other popular areas: relational
database and APL-database
interface.Compower last week officially
launched the APL service, which
has been running in test mode
for about 18 months. Most of its
users have been within the NCB,
but there are at least two outside
users, in Birmingham and Wid-
nes.Like many APL bureaux,
Compower sees many of its
potential users in the commer-
cial sector, as well as the
scientific market for which the
language was originally con-
ceived.Compower's APL is an imple-
mentation of IBM's APL/SV on a
370/148. Processing is particu-
larly fast on this machine since
the APL support software is
partially microcoded.Compower's "relational" da-
tabase scheduled for release at
the end of next year, is based on
the bureau's existing YES/1
database management software.
This is fundamentally a multi-
ple-indexed file system, but
data description and data man-
agement as the user sees it is in
terms of a network data struc-
ture.CBE for
Burroughs'
chairmanRAY MACDONALD, chairman of
Burroughs, which has seven plants
in the UK, has been awarded the
CBE for "outstanding services in
furthering Anglo-American rela-
tions." MacDonald will be invested
in Washington on November 30 by
British Ambassador Peter Jay. The
CBE is an honour that can be
conferred upon non-UK or Com-
monwealth citizens. MacDonald
has been with Burroughs for 44
years. He was made president of
the company in 1967 and became
chairman in 1973.PO engineers
go backOVER 1,800 Post Office engi-
neers who staged a two-day
walk-out last week are back at
work following the reinstatement
of 28 of their colleagues.The 28 engineers at the St.
Botolph's international exchange
were dismissed for taking
action in support of a demand
for a "dirty and discomfort"
allowance.Negotiations on the allowance,
between the Post Office Engi-
neering Union, and the Post
Office have now resumed.Honeywell
wins \$52m
US govt
contractsTWO US government contracts
worth a total of \$52 million have
been won by Honeywell from
the Veterans Administration
and the Internal Revenue Ser-
vice.The US Veterans Adminis-
tration, which looks after the
welfare of ex-servicemen, is
spending \$38 million with
Honeywell on a comprehensive
nationwide computer network
which will enable beneficiaries
to receive their money within
minutes rather than days.This will be one of the first
implementations of Honeywell's
Distributed Systems Environ-
ment. Involved in the contract
are three dual 86/80s, a dual
68/60, more than 100 Level 6/36
minis and hundreds of VDUs.The contract from the In-
ternal Revenue Service is for 13 of
Honeywell's PPS non-impact
page printing systems, which
have been on offer in the US for
a couple of years, but arrived in
the UK only two months ago
(CW, September 29).THE command and control system for the West Midlands police (CW,
February 3) has entered the final stages of its development with the
delivery of the production hardware, a dual Ferranti Argus 7008, to
Lesso's offices in Maidenhead, Berks. Lessco has been designing and
implementing the system for almost a year, using an Argus 700E.

Ferranti raises £25m loan

FINANCIAL recovery of Fer-
ranti took another step forward
last week with the announce-
ment of a £25 million loan from a
consortium of banks, which will
allow the company to pay back a
£8.33 million debt to the NEB
and an estimated £9.8 million
overdraft. Taking advantage of
lower interest rates, Ferrantiwill be able to finance the loan at
a lower cost than previously,
while using the balance after
payback to provide working
capital. This will no doubt be
used to fund continuing devel-
opments in electronics and
computers where the company
feels it has an edge over its
competition.Exciting things happen
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DOWNTIME

No laughing (gas) matter

A ROBOT designed in defiance of Asimov's First Law of Robotics made its debut at the recent annual seminar of the American Society for Industrial Security, in Florida.

Named Century I (nothing to do, I hasten to add, with NCR), it costs \$75,000, is seven feet high, and is programmed "to find and immobilise intruders". Sensors can detect movement, body heat or noise, and then "locks in on you", as Quasar Industries robot expert, Anthony J. Reichelt, put it. Then the stalking begins.

Quasar Industries, of Rutherford, New Jersey, who designed Century I, says that when the robot gets within about 6ft of an intruder, it instructs the stranger orally to stop. If disobeyed, it gets tough — how tough depends on which of the available op-

tions have been added. Standard equipment includes a high frequency sound generator that can cause extreme pain in the inner ear. Options include a strobe light to blind the intruder temporarily, an electronic gun that delivers a powerful electric shock and a mechanism that releases laughing gas.

Mr Reichelt said that the Royal Bank of Canada, plagued by robberies, had asked if a Century I could be programmed to kill. He told them it could, but added that his company planned to use only "non-lethal restraint" in the robot.

If you happen to be both an innocent visitor and so deaf you can't hear the robot's challenge, it's presumably your hard luck if you're blinded, stunned and gassed as well.

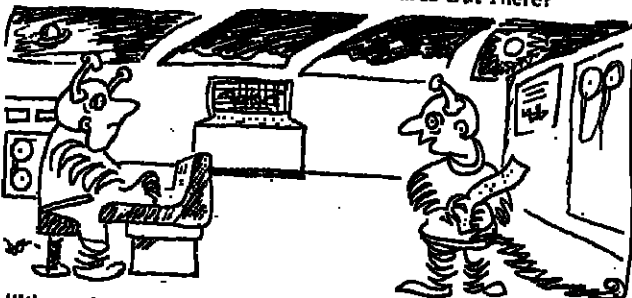
Signs of Life?

A RECENT discovery, reported in New Scientist on October 13, suggests that there may be many more civilisations in the universe than had been thought. The discovery was made by Dr Robert S. Harrington of the US Naval Observatory, who made a computer analysis in which he "pretended" that the planet Jupiter was a star of the sun's mass.

To his surprise, and that of all apple-lovers too, the analysis indicated that the earth's present orbit was more or less unaffected by the stronger gravitation. The galaxy's uncoupled two-star

systems could therefore be suitable for the emergence of life in recognisable form. The findings have already stimulated new interest in composing radio messages to putative other civilisations (granted that life on Earth is civilised).

Although the transmission of messages which, by the very nature of things, will not be received during the lifetime of the system sending it, is contrary (I hope) to the practice of my readers, I wonder what signal they would compose for the enlightenment of our fellow creatures Out There?



Positive feedback

ON the BBC's Nationwide programme recently a Weather Forecast presenter, faced with a typical forecast as shown on American TV, with its battery of satellite photographs, radar plots and computer predictions, retorted (and showed) that, given enough funds, the Met Office could provide viewers with even more in the way of graphics, driven by even more sophisticated computer systems.

And then the other night I heard on the old steam radio that an MP had actually checked the 24-hour weather

forecast with reality over some months and found that more often than not they had proved to be inaccurate or, as we say at the bus stop in an unforecasted deluge, wrong.

I'm not knocking anyone, but ask in a split second pure scientific inquiry, whether a similar statistical check has been made on computer horoscopes? Perhaps a merger could be arranged, and Mr Fish (Places) could advise us not only to wear our wellies but to beware of the malign influence of Saturn's presence in our ruling House. I'd still believe him.

Futureviewing...

I WAS surprised to learn that pupils of George Heriot's School, Edinburgh, have been having trouble with maths. The school did, after all, develop, from Heriot's Hospital, founded by James VI and I's pawnbroker/financial adviser, Jingle George.

Now all is well, thanks to the school's use of a computer: the boys, it is reported, "now show a willingness to argue about mathematics, not only with the staff of Edinburgh University's Department of Artificial Intelligence, who are conducting the experiment, but also with Her Majesty's Inspectors on their visits to the school."

Completing software projects on time

FOLLOWING the recent publication of Tom Gilb's Software Metrics (reviewed CW, September 22), discussion is developing about the realities of measurement of certain aspects of computer systems. Not least of these is the field of estimating the resources required in programming and systems work.

As every competent programmer knows, there is only one sure way of finding out how long a programming task will take and that is to do it. The other, less certain, way is to start estimating. Estimates are usually made conservatively to allow for unforeseen circumstances, but most computer projects seem to over-run on time or cost, or simply fail to meet specification.

There are many examples in the literature — books, magazines and newspapers — of computerisation projects that have ended in disaster. Sometimes the hardware doesn't arrive, sometimes the software. When the software does arrive it is often riddled with bugs. It is not uncommon for a system to take two years from its original delivery date to attain 5% effectiveness. So-called real time systems get installed with response times that render them analogous to jet aircraft taxiing from New York to Los Angeles.

Not all projects fail as miserably as these examples, but in the computer field, estimates are rarely met and almost never reduced. Why is this? Why is there an inexorable trend upwards in time and money costs of software?

The problem lies in the inflexibility of the estimates once they are made. Management likes to keep to its schedules, rather than capitalise on the success of technical people and encourage them to get in front of their timetable.

Many of the time that a young naive engineer or programmer has completed a task early and been castigated for it rather than rewarded. Such people are treated as troublemakers. Not only do they alter the critical path of a project and cause extra work for management in rescheduling the work, but they also discredit the managers who made the original estimate for the task.

Conventionally, the correct course of action is to take about 10-20% more time on a project than was estimated, thereby earning mild retribution from the non-technical management, who can then kid themselves that they have been in control of the project all along. Any spare time found or created by the application of genius must be filled out with artificial pseudo-work which non-technical managers have invented as a much more easily measured activity.

This phenomenon is not restricted to the computer field. It occurs in any work environment where a supervisor is

responsible for work he does not understand. Workers are rewarded for the appearance of work rather than work itself. Such attitudes towards programmers show a high correlation with the type of autocratic management style found in so many large business organisations. This type of management has always been aware of the human element in programming, but has invariably attempted to eliminate it rather than to understand it.

This de-humanising approach is even more dangerous when directed at user departments. The user must be involved right from the start and, when necessary, technical points and their implications must be explained in everyday language. Summarising, we have four main points which must be emphasised to increase the probability of success for a computer project:

1. Set objectives for each "planning-level" of the project.
2. Involve the user (customer) throughout the project.
3. Treat members of the project team as human beings, allowing them to develop and use diverse skills, and involve them in the planning of their work.
4. Reward people for achieving objectives which are in line with the success of the project, rather than the mere performing

of activities which can degenerate into pseudo-work.

The key to the whole thing is the specification which, to be effective, must serve as a communication link between computer-oriented programmers and the user department or customer organisation.

The gap must be bridged between the computer people who think quantitatively in vague, human terms. We need to prepare a specification which is capable of being understood by both sides. However, this immediately presents us with another problem. As we delve more into the details we realise we are getting further away from the "perfect specification" which we have come to demand as the starting point of our "guessing game". But as we have already seen, our conventional estimating procedures tend to encourage over-running of deadlines anyway, so why worry if the specification on which they would normally be based seems to be disappearing into the distance?

Instead, let us follow our line of argument and see where it might lead. If we accept the possibility that the original specification should be subject to negotiated alteration during the life of the project, it becomes conceptually much easier in the initial stages to accept that some

points are still open to discussion and will not be resolved until the project has started.

Apart from any other advantages, this approach is realistic. It complies with the facts that the computer people have only a hazy idea of the user's requirements, and that the non-computer people probably have some pretty funny ideas about what computers can do.

By encouraging this realistic approach, progress meetings can be welcomed as opportunities for educational and constructive negotiations, whereas in conventional project work they often degenerate into forums for gladiatorial combat and malicious recrimination.

Developing the theme, the initial specification becomes very much a document for the strategic planning of the project, identifying milestones which can be tied to progress meetings and laying down guidelines for the discussion and implementation of the tactics to be used at each stage. As the project progresses, the original specification between user requirements and machine capability grows wider rather than wider, as is the case in poorly co-ordinated projects.

By encouraging the participation of programmers and designers in the design process, satisfaction is enhanced, programmer performance is improved, and the possibility that projects will be completed on time and at cost.

*Software Metrics by Tom Gilb, 282pp. £11.15. Prentice-Hall International.

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Did the government cause Cross to resign from ICL?

From front page

company had looked at some American companies but were not, at this stage, prepared to buy. Cross said that ICL was free from "government interference". Besides talking about his children's poor health, the only

other reason Cross gave for his departure was that the industrial relations situation at ICL, although better than elsewhere in the country, had meant that ICL results were only "excellent" rather than "absolutely superb". He gave his successor, Dr Chris Wilson, the ominous

message that he hoped he would be more successful in proving to ICL that the real competitors were IBM "and not ourselves". Earlier this year, Cross criticised government policy because he felt the social system was too easy on strikers but did not reward hard work well enough.

Cross' decision to resign took everyone by surprise, particularly as he had only recently signed a five year contract (CW, June 9) at which time he was aware of his children's health and of the state of industrial relations in the company. He will be released by ICL from his contract, although he still holds the option to buy up to 100,000 shares at £1.50 each.

He flew out of London to California immediately after the press conference announcing his resignation but he will not leave the ICL board until the end of the year.

His successor, Dr Christopher Wilson, commenting that he had had little direct experience in manufacturing, said, "With the help of the professionals trained by Geoff, I aim to learn quickly."

He said he intended to continue the Cross style of management. "Once a problem at a user site gets beyond a certain point, I shall be told, at whatever time of the day or night, just as Geoff has been," he declared.

On industrial relations Dr Wilson said that following Geoff Cross was a daunting task "but I am not daunted by the unions. I shall adopt the same approach as Geoff has done." And Tom Hudson commented that there was better understanding and trust with the unions now and Cross intended that he agreed.

Paying tribute to his predecessor, Dr Wilson commented that the best thing Cross brought with him was a sense of discipline. "He taught us that profit is not a four-letter word."

Marketing unit for university research

UNIVERSITY research and consultancy services are to be promoted by a marketing organisation set up by Manchester University's Institute of Science and Technology. UMIST Research and Consultancy Services will negotiate contracts with commercial companies and other organisations on behalf of the Institute.

UMIST's contacts with industry date back to 1824, when it was formed. About 12 years ago it set up a Bureau of Industrial Liaison to seek opportunities for collaboration with industry, and it has also set up industrial service units which bring together staff from different disciplines but whose research interests centre on a particular industry.

The latest is a microprocessor engineering unit, which will cover hardware and software development and training for the institute for the industry. UMIST Research and Consultancy Services has been formed as a central organisation channelling contracts to these different units. It is supported initially by a grant from the Institute but it is expected to become self-financing.

A director has just been appointed. He is Dr Roger Holdom, currently senior lecturer in industrial microbiology at Strathclyde University.

Digico 'foothold' in Chinese market

AN ORDER from China for a Digico M18E minicomputer is seen by the UK manufacturer as the first foothold in a market which it believes has "massive potential".

The minicomputer is at the heart of a rock magnetometer developed at Newcastle University (CW, September 18, 1976) and ordered by a Chinese government department in Peking for an unnamed installation.

The M18E is being supplied with an analogue-to-digital converter and a Teletype, but no other peripherals.

Digico is supplying spare parts for two years, but the system will be maintained by the Chinese.

Malcolm Bowden, Digico sales manager, said he expected the company would be asked to add to the system within a couple of months. And Digico had already been asked for quotations for a wide range of systems.

"There is massive potential there," he said. "They have their own computers but no knowledge of interfacing or experience of configuring systems."

Digico has added agents in Hong Kong, Thailand and South Africa to its distribution network which already takes in Greece, Turkey, Denmark, Sweden and Norway. All these agents have been appointed in the last year as part of an overseas expansion plan, and in the next year the company expects to do 30% of its business abroad.

Denmark has been the most successful overseas market, with 14 orders since February. Three orders have been taken in South Africa and two in Greece.

The company is taking a responsible attitude towards its agents. "Anyone can appoint an agent," said Bowden. "But we insist that ours take a £25,000 system and train a number of staff on our equipment. We know that our distributors are committed because they have to invest £100,000 in equipment and training before they start."

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GILB'S MYTHODOLOGY

The best idea
for the
last decade



THE best, single management idea in data processing for the last decade is the Inspection method, developed by Michael Fagan and Rodney Larson of IBM in New York. It took two years for IBM to begin to tell their customers about their experiences with the method (Systems Journal 3/78) and even though they have now begun to spread the good word, not everybody has listened or heard the message. In particular, I hope to reach non-IBM customers with my attempt to awaken interest in the Inspection method.

Inspection is a grandson of "Structured Walk-Through" but it is so different that it requires a different name. I have recently heard the term Structured Inspection from an IBM executive, but that is simply pandering to the mass hysteria for everything "structured".

Inspection is a quality control process. It has been applied to five main phases of system development: high-level design (which includes records, etc); low-level design (pseudo-code logic planning for each module); program logic coding; test strategy planning; and test case coding.

In all of these cases the Inspection is applied BEFORE ANY MACHINE TESTING TAKES PLACE. The objective and the result is to save time, while improving the quality of the product in relation to its objectives (usually reliability, maintainability, performance).

Inspection is carried out in a series of phases prior to and as clean up after an inspection meeting. There are about four inspectors who are charged with documenting suspected faults in the documents inspected. A fault is any deviation from higher level design specifications or standards. Faults are classified statistically by type (logic error, maintenance, for example), by whether they are Missing, Wrong or Extra, and by degree of seriousness:

Minor (cosmetic) or Major (unacceptable).

The resulting statistics are cumulated on a database by module, and are tagged with data such as who created the documentation, who inspected, and how much time and effort was involved in various stages of the process.

The result is that the managers at several levels finally have a fairly sensitive accounting system for design and programming work. In the hands of good managers, this will allow more objective judgment of all organisational and technological changes.

The bottom line results of using the inspection method have been impressive. The results have been repeatedly attained at several places within IBM - and in outside customer sites.

In conservative and well justified measuring techniques, Fagan reports a net human productivity increase of 23%. Net means after all costs of using the method have been accounted for, and the productivity improvement is still 23%. Fagan carefully tests to see if the Hawthorne Effect (improvement in short term due to effect of change and management monitoring) is responsible for his results, and reports that it accounts for 1% of the 23%. Fagan also has statistics which allow him to compare the error frequency of inspected program code, as opposed to code processed by conventional Walk-Throughs. The inspected code is 38% less error-ridden, states Fagan, based on a sample. If Fagan were less conservative, he would have calculated the higher quality in terms of an additional productivity improvement to his 23%. These figures apply when only two of the five inspections (namely pseudo-code and program code) are applied.

Fagan got his results on ordinary projects which he managed at IBM, which used IBM's private "PL/I" high level assembler. He has, however, had the method

tested at Aetna Life with Cobol programs with approximately the same results and with the initial many months of operational running of the inspected programs totally error free.

A client of mine, Standard Bank of South Africa, a large IBM shop, did not report productivity, but did report repeated error free running of inspected programs. Terry Baker, of IBM's Federal Systems Division, told me they were using Fagan's method and getting the same results.

Rodney Larson applied the Inspection method to Test Planning and Test Case Construction quality checking. We know from automated instrumentation of programs by Stucki (now with Boeing) and E. F. Miller (now an independent consultant in San Francisco) that even in high quality environments, a very large part of the program logic is never tested by any test cases.

It is not surprising, therefore, that quality control applied to the two phases of test case development by Larson, resulted in an incredible 88% savings of programmer time, and a corresponding machine time saving.

One of the cuter tricks Fagan reports is the calculation of error density at an early stage of each module's life. This is the basis for predicting reliability and maintenance problems before they occur, and perhaps doing something about both the source and the product (like throwing it away and writing a new one before you expend the other 85% of its cost to the project).

For more information on Inspection see my book Software Metrics (Winthrop) which has extensive coverage, or get it straight from the horse's mouth, free, TR 002873, IBM Systems Journal 3/78. (Reprint Order G321-5033); for Larson's Publications ask for TR 21386. Even non-IBM customers should try; this is the most cost-effective product to come out of IBM for years, and certainly the most portable one.

SOFTWARE FILE

The softer side of Compec

ALTHOUGH Compec is, first and foremost, a hardware exhibition, the increasing importance of ready-made software to the user was evident this year.

Although Pansophic Systems was the only company appearing under the classification "software" in the Compec catalogue, a number of other companies made software a prominent part of their display, showing both their own packages and some produced by other companies for their machines.

Prominent on the Prime stand, for example, was consultancy Wooton Jeffreys, which fielded its own representative, promoting its text processing system, implemented on the Prime 300 minicomputer.

An unusual characteristic of the Wooton Jeffreys system is that it does not necessarily treat all data identically as part of a character string. Numerical data included in documents is often part of the program logic in the installation. Wooton Jeffreys allows such information to be passed direct from the document to these programs.

Prime also demonstrated the capabilities of its mini through the CAD Centre's Gino-F graphics package, which was producing three-dimensional drawings at a terminal on the stand. On its own behalf, Prime was showing its Midas multiple-indexed filing system, entering and retrieving details of visitors to the stand.

The Pactal consultancy devoted most of its stand to a demonstration of the MicroSim program development system for microprocessors, which it developed in collaboration with consultants D. M. England and Partners. Pactal is about to conclude a sale of several MicroSim systems to its first overseas customer, in Scandinavia.

MicroSim has been implemented initially on the DEC PDP-11, to produce assembly programs for the Intel 8080, but extension to other source machines, other micros and other languages is planned. MicroSim compiles a program line-by-line, as it is entered, pointing out errors. The program can then be run in a simulated micro, or sent down a

line to a real micro, for testing. A particular feature is the detection of attempts to execute a data field or address. The final program is output in binary loader format, ready-linked, on paper tape.

CPU Computers, showing its Intel 8080-based M-100 micro-processor configuration, gave prominence to the Modular Accounting Package (MAP). This includes, on the one hand, a sales ledger program, with purchase and nominal ledger to come, and, on the other, an inventory management system. Also planned for future release is a payroll package.

Software formed a minor exhibit on most other stands, but was, nevertheless, an effective demonstration tool for companies showing processors. Data General showed its ANSI 1974 Cobol in interactive mode

to demonstrate the CS commercial system.

At the other end of the capability of the MITS "multi-user Basic" expected to reach the UK in Compec soon. This was followed by a multi-user access Basic, allowing users to work with the program.

Judging from the way expressed by visitors to software shown, many software companies were giving a chance by not exhibiting.

Pansophic certainly valued positions as the sole software representative. UK managing director Dunn contended that long exception among room hardware companies had off in attracting more visitors to the stand.

CAP's first packages for Xtel Micro-File system

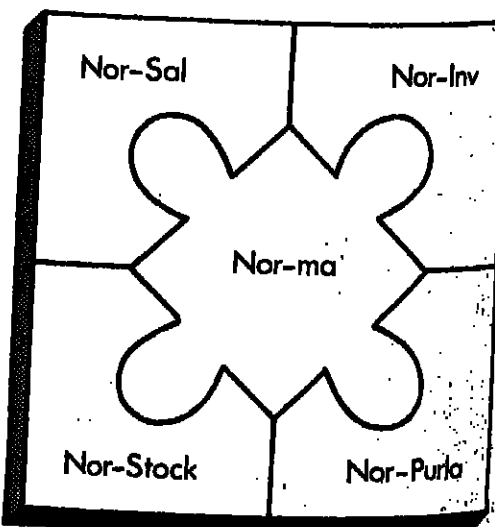
FIRST instalment of a CAP software development for the Xtel Micro-File system shows that interest in microprocessors is not confined to the company's Microsoft division. The development is in the hands of CAP's General Projects group, in Reading.

The packages available now are designed to handle invoicing and sales ledger, but a wide range of accounting software is planned, under the generic name Capstar. Payroll will be the next application to be approached.

The suite will initially be implemented on the based Micro-File (CW, 1976). Implementations on micros will be considered. Micro-File reaction to Micro-File suite has been luted.

At present the invoice sales ledger programs available from CAP or Xtel are still to be sold. They are priced at £1,000, and Micro-File system itself supporting software, £800.

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EDITED BY STEPHEN BELL

Coral 66 compiler for F100 now in use

THE expected Coral 66 compiler for the Ferranti F100L micro-processor has been completed, by Systems Designers Ltd. The compiler, an implementation of SDL's portable Coral project, is already in use within Ferranti, and will be provided to its first customers soon.

The initial implementation is a cross compiler, running on the ICL 1900 series. A resident version should be released by next April to run on the F100L Development System. Other cross compilers will be released as required, says SDL. Since the compiler is written in Coral, it should be easily transferred on to any machine with a resident Coral compiler.

The F100L Development System, now being produced by Ferranti, includes twin floppy discs, operating system, resident assembler and link editor, text editor and debugging package. Provision of Coral will make the F100L the only 16-bit micro offering the language, SDL claims.

The compiler includes SDL's standard program development aids, as provided with the other implementations. An additional facility enables the user to describe within the source program a variety of system characteristics, such as the proportion of read-only and random access memory.

RTL/2 marketing drive in the US

WITH the number of major users of ICI's RTL/2 language in the UK and Europe rapidly increasing, the language's marketing agent, SPL International, is set for a big RTL/2 marketing drive in the US, with the help of its Insac connections (CW, October 13).

Agreement with Insac on an outlet for the language is not yet finalised, an SPL spokesman emphasised, but the company is "fairly optimistic" about an early conclusion.

If all goes according to plan, SPL will operate through Insac's

office in New York from the beginning of next year. It will market a range of products and services, but RTL/2 will spearhead the effort.

SPL has previously operated in the US, both on its own behalf and as a subcontractor to other companies, but has not previously had a permanent US base. There are users of RTL/2 in the US, the company confirmed, but names cannot yet be disclosed.

When RTL/2 first became generally available, it was widely looked upon as a rival to the UK government approved real time language, Coral 66.

This rivalry has since moderated a good deal. For example, a Ministry of Defence installation at RAF Sealand uses the language (CW, June 3, 1976). If the National Enterprise Board's export venture decides to handle RTL/2, it will be another sign of this trend.

A number of well-known UK names have joined the ranks of RTL/2 users over the past six months, and some of these have just been disclosed by SPL. Many will also be using the language in projects on the Continent.

In the forefront are GEC's process control division and Plessey. GEC is to use the language in process control

configurations based on the Digital Equipment PDP-11. The division will also use SPL's Multi Task System (MTS) operating software, but some of its configurations will be based on GEC's own RSX-11.

Information on Plessey's use of the language is lacking at present. The company confines itself to stating that RTL/2 will be used "in a wide range of systems using PDP-11s".

Aircraft manufacturers Hawker Siddeley is using RTL/2 to develop software to support a PDP-11-based network carrying aircraft design applications.

Other new users include Courtauld, with an automatic weighing system controlled by Computer Automation Alpha LSI-2s, and Racal, with PDP-11s in an undisclosed application.

Two more UK users for IDMS

ANOTHER two major UK users have been gained for Cullinane's IDMS database management system, bringing the number of UK IDMS users on IBM machines to 13. The latest installations are the Corporation of Lloyds and process control instrument manufacturer Taylor Instrument.

Lloyds is using IDMS for its control accounting system, primarily involving the processing of insurance premium and claim payments between Lloyds underwriters and brokers, and the provision of statistics. The software will be implemented on Lloyds IBM 370/135 and 145 mainframes.

Taylor Instrument will put IDMS on its IBM 370/125, to handle bill-of-materials applications and to interface with a material requirements planning package.

All IDMS users on IBM machines in the UK have acquired the package through Solcon.

Fujitsu starts selling Aim

AFTER four years' development, Fujitsu has begun to provide its users with an integrated data communications and database management system. Known as Aim (Advanced Information Manager), it is at present provided for the larger models of Fujitsu's Facom M series. Work is in progress on transferring the software to the

smaller models of the series. Experimental users of the Aim software include the Bank of Tokyo, the Matsushita Electrical Works, and 18 other installations.

The price of Aim is comparatively low for database/data communications software, at between 100,000 and 300,000 Yen (\$384 to \$1,153).

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Tape library management package from Computer Associates

FOLLOWING the release of its Dynam/D disc-space management software (CW, April 51), Computer Associates has turned its attention to tape files, with a tape library management package known as Dynam/T.

The new package will not be released by the company's UK

branch until early next year. As with Dynam/D, Computer Associates UK is waiting until the package has a stable user base in the US first.

Dynam/T's most significant capability, according to the developer, is its management of every file on a multi-file,

multi-volume set of tapes. When a given file is requested, the software recognises volume identifications on each tape, finds the file on the appropriate volume and positions the start of the file under the read/write head, whichever device it is mounted on.

The package keeps a log of exceptional events and can generate reports on all tape activity. It releases devices quickly for use by another partition and provides automatic release of sort work files.

At the same time Johnson Systems, whose Job Accounting Report System (JARS) is marketed in the UK by Computer Associates UK, has founded a European support centre, in Brussels. The aim is to strengthen liaison between Johnson in the US and its European agents

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October 1977

PEOPLE

Entries invited for Export Year Awards

SUBMISSIONS for Export Year Awards from companies and employees are invited by the sponsors of Export Year, which include the British Overseas Trade Board, the CBI and the Association of British Chambers of Commerce.

The awards will be presented by HRH the Duke of Kent, Patron of the Year and vice-chairman of the BOTB, at the Export Year Conference. The Duke, who will be chairman of the judging panel, is also a patron of the BCS.

Over 2,500 companies, including

GEC-Elit, UCC Computer Instrumentation, Rediffon and STC, are taking part in the Export Year, which is an attempt to boost exports by involving the shop floor in export matters.

The judges will be looking for contributions which have encouraged greater understanding of the part played by everyone in the company's export effort. Companies are asked to submit Export Year display material and publications, while employees can submit any contributions they have made.

Trophies will be presented to winning companies, and prizes of £200, £150 and £100 to employees.

The Conference is to take place at the Metropole Hotel, National Exhibition Centre, Birmingham on January 24. Deadline for applications is December 31, and full details can be obtained from the Export Year Office, British Overseas Trade Board, 1 Victoria Street, London SW1H 0ET, tel: 01-215 5180/8383.

Ian Pucknell, former inside sales engineer with GEC at Burgess Hill, has joined Amplicon as sales office manager.

Reg Medlock, technical director of the George Kent group, has retired after 42 years with the company, but his services will still be available on a technical consultancy basis.

London office for Geest Computer

A LONDON office has been established by Geest Computer Services to provide support to its Birmingham, Cambridge and Peterborough bureaux, and Birmingham-based Geest Minicomputer Systems.

The address is: Room 8, London Fruit Exchange, Brushfield Street, London E1 6EB, tel: 01-247 2438. Terry de Laney, who joins Cambridge Computer Services as a salesman from BOC Datastore, will be based at the new office.

DIARY

NOVEMBER 21
Computer-aided cost estimation, discussion meeting, Institution of Electrical Engineers, IEE, Savoy Place, London WC2 1LJ.

Machine-aided synthesis of rules of thumb, Edinburgh University Machine Intelligence Research Unit, Hume Tower, George Square, Edinburgh, 17.15.

NOVEMBER 22
Meet the members - Inaugural meeting, DPMA, Sussex branch, 18A Chapel Road, Worthing, Sussex, 18.00. Contact: A. Kassam, tel: Worthing 34755.

How well does a manager manage? Brian Beetham, Data Processing Management Association, Builders' Exchange Club, Sheffield, 18.00.

A systems approach to pictorial pattern recognition - lecture series, Morton Naylor, Machine Intelligence Research Unit, Chess Lab, MRU, University of Edinburgh, 10.30.

NOVEMBER 22-23
Structured program development, John Parker, BCS, London branch, London. Details and registration through BCS, 01-637 0471.

Cheques on view

OUR picture shows Jimmy Tarbuck, representing the Prince of Wales (part of the Jubilee Fund) and Nerys Hughes for the Prince of Wales Committee, with cheques totalling £7,000 presented to them by Sir Alf Ramsey. The money was raised by Violonhira, the TV rental company, when they sponsored the 1986 World Cup Commemorative and Royal Jubilee International five-a-side football tournament.

The presentation was made at the opening of Violonhira's new computer and admin centre, Electronic House, in Preston, Lancs. About one million rental accounts are handled at the centre by an ICL 1903T, with Violonhira branches throughout the country online. Also seen are (left to right) Kevin Johnson, MD of Violonhira, Kenneth Volstenholme and Sir Alf Ramsey.

SPSS Users' Group to be formed

A MEETING to launch a users' group for SPSS, the Statistical Package for the Social Sciences, will be held on February 8 in London at 2.00 pm. The package is the most widely used in the UK for survey analysis, both for academic and local government surveys, and in teaching at undergraduate and postgraduate level. All users and potential users of SPSS are invited to attend. It is hoped that subgroups may be set up, for teaching, research, admin, etc, and anyone prepared to help in this should contact John Hall on 01-607 2769, ext 5028.

Roy Spence has left the Burton group, where he was director of computer services, to take the newly-created position of data processing manager with Courage's management services department.



Derrick Masters, Mike Parri-Hughes and Maggie Drewery have joined Molex Data Sciences as sales executives in the Southern region. Masters joins from CMC, where he was a technical support analyst, Parri-Hughes from Rediffon, where he was a sales executive, and Drewery, a former analyst-programmer, from ACS.

Robert Hall has joined Amdahl UK as systems support manager, from IBM UK where he was systems engineering manager.

James Aky, director of Liverpool University's computer laboratory, becomes chairman of the Merseyside branch of the BCS.

Adrian Axon, formerly a Klenzie salesman, has moved to Allied Business Systems as a sales executive for South Wales.

T. Eugene Smith has become vice-president and general manager of Pertec's microsystems division in Los Angeles. He was formerly president of Loftis Engineering, and before that held several consecutive vice-presidential positions with Texas Instruments.

He succeeds J. David Callan, who becomes assistant to the group officer, with responsibility for evaluating new business developments and product line expansions for the Pertec division and the microsystems division.

Alan Lloyd has joined Wright Air Conditioning to become director and general manager of the new Bristol subsidiary. Ken Dalton joins the parent company as sales director. He was formerly an executive with Oscar Faber and Partners, an engineering consultancy.

Top marks in BCS Exams

TOP performers in the BCS Exams Parts I and II, will receive £75 each at the Annual Dinner on December 12, Imperial College, London. Basil de Ferranti will present cheques to Paul Seligman, a programmer at the University of Cardiff when he took the exams. Timothy Jones, a systems programmer at the NPL.

Guest speaker at the dinner: Sir Brian Flowers, rector of Imperial College. A few tickets are available (£17 double, £9.50 single) and can be reserved by phoning Hine on 01-222 4104.

Microprocessors, R. Brunsell, BCS, Teesside branch, Teesside Polytechnic, Middlesbrough, 18.00.

The present and future for computer peripheral technology, S. O'Connell, BCS, Edinburgh branch, Mountbatten Bldg, Heriot Watt University, Edinburgh, 17.30.

UNIVAC Series 80 Users' Association, conference, Selfridge Hotel, London W1, 10.00.

NOVEMBER 24
Computers in action, BCS Medical (Scotland) Group, The medical school, Ninewells Hospital, Dundee, 11.00. Details: D. L. Simpson, tel: 041-339 8822, ext. 73.

System 10, its place in ICL's range and its capabilities, Alan Wakefield, BCS, South Wales branch, Students' Union, Park Place, Cardiff, 18.00.

NOVEMBER 24-25
Meeting IBM Computer Users' Association Programming Group, Grand Hotel, Bristol.

NOVEMBER 28
Proving chess strategies correct, Edin-

burgh University Machine Intelligence Research Unit, Hume Tower, George Square, Edinburgh, 17.15.

NOVEMBER 28-30
Managers, databases and information systems conference, IFIP/IAIG, Amsterdam.

NOVEMBER 28-DECEMBER 2
Automatic testing and IEE/IEE conference, Metropole Convention Centre, Brighton.

NOVEMBER 29
A year's change, Philip Hughes, BCS, ACM Chapter, Polytechnic of Central London, London W1, 18.30.

A review of do-it-yourself computing, Dr M. Henley, Institution of Electrical Engineers, IEE, Savoy Place, London WC2 5LJ.

Development and exploitation of programmable automation, symposium, IEE/MechE Institution of Mechanical Engineers, London SW1.

Computing in Hospitals, Dr E. C. Coles, Data Processing Management Association, West of London to Oxford branch, The Bull, Gerrards Cross, 18.45.

NOVEMBER 30
Management Education Seminar: Unions in the computer room, Tim T. Cluff, Data Processing Management Association, Metropole Hotel, Brighton, 14.00.

British activity in online information services, David Martin, Dr Philip Hughes, BCS Information Systems Group, University, London EC1, 14.00. Tel: £1.00 from Information Retrieval Society, Scicnn, 01-560 5599.

NOVEMBER 30-DECEMBER 1
Meeting, IBM Computer Users' Association Local Authorities Group, City Hall, Wakefield, Yorks.

DECEMBER 1
Pattern-based chess knowledge in man and machines, D. Michie, Edinburgh University, James Clerk Maxwell Bldg, University of Edinburgh, 17.15.

Who needs cash anyway? J. N. Lipp, BCS, Oxford branch, County Council Staff Restaurant, Paradise Street, Oxford, 18.45.

Ceefax, what it does and how to use it, BCS, Chester and N Wales branch, Chester, 18.30.

IBM Series/1- Some flexible solutions for your distributed data processing problems

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For the DP Manager who is looking for reliable, cost-justified solutions in his DP environment, the IBM Series/1 offers big performance at a low price.

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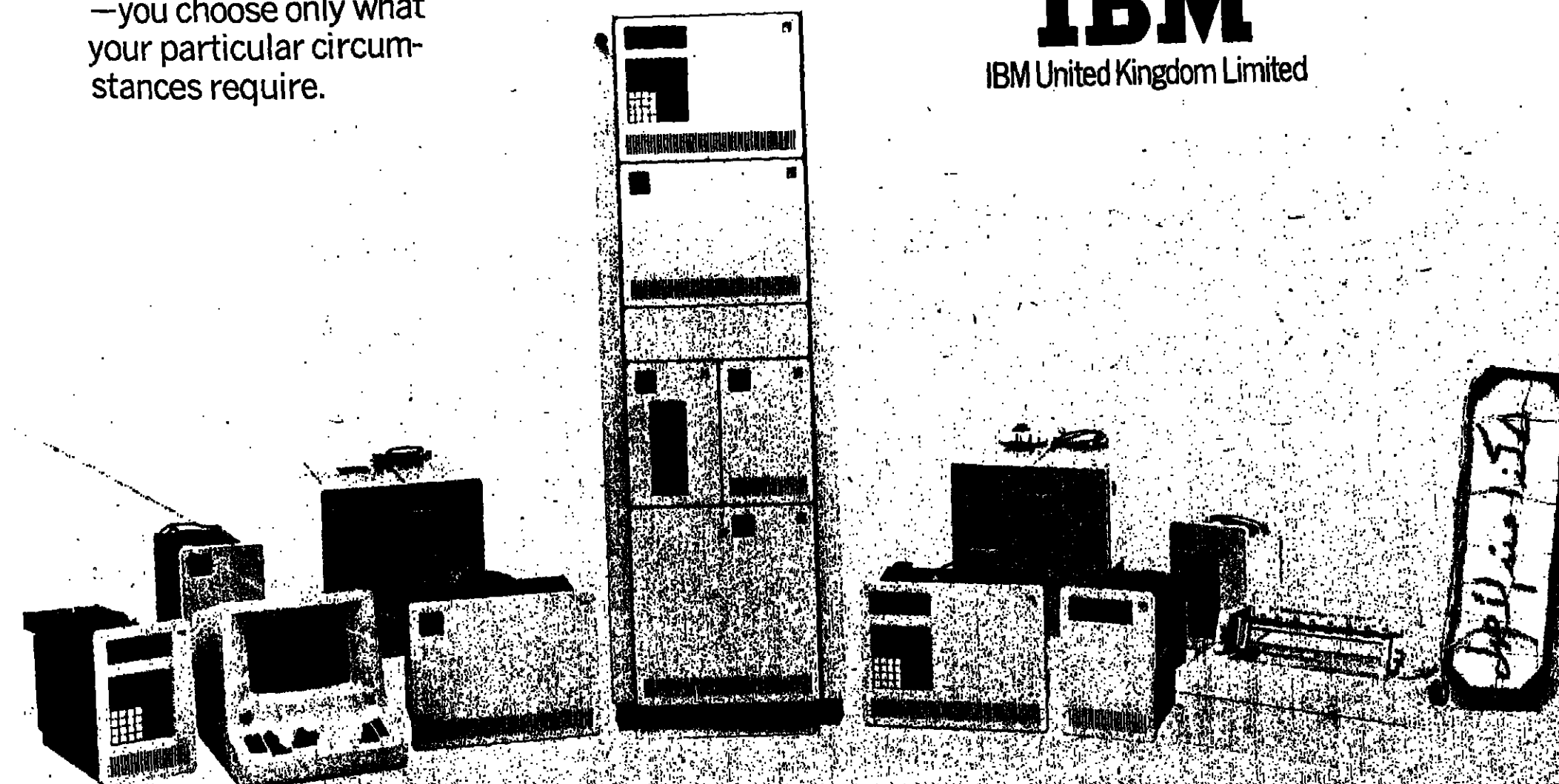
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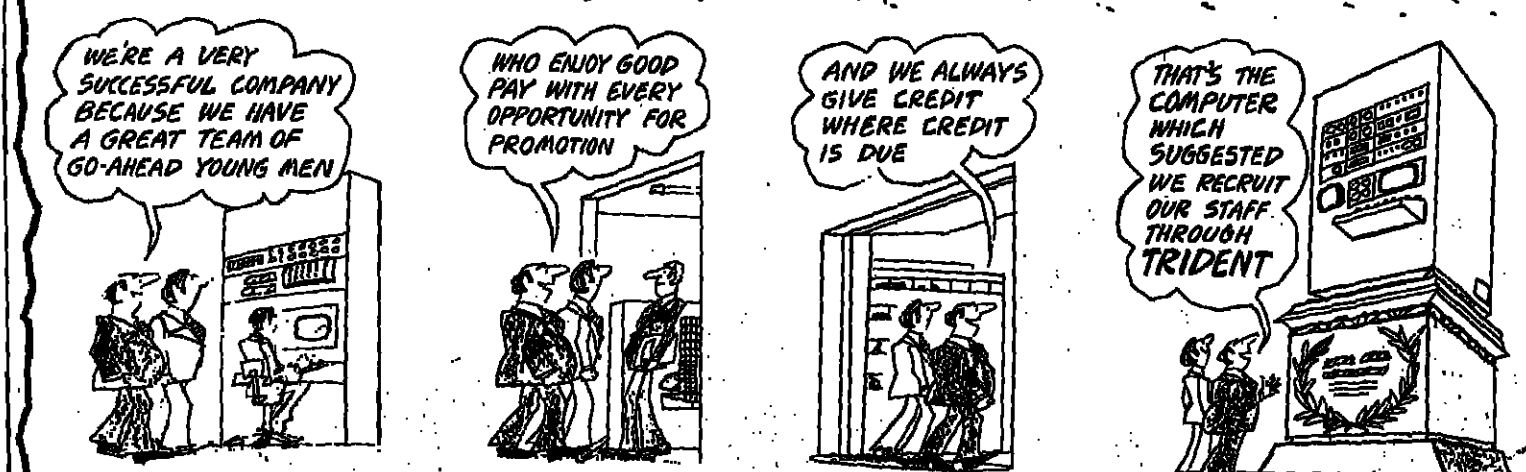
If you'd like further details of IBM's Series/1 systems (prices start from around £7,500), call Rick Ackland Snow at: IBM United Kingdom Limited, General Systems Division, London Wall Branch, 40 Basinghall Street, London EC2. Tel: 01-628 7700, ext. 2661.

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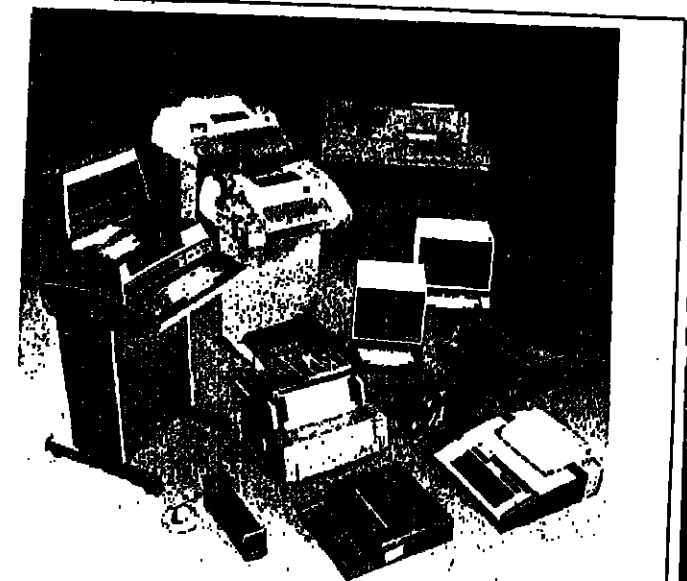
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COMPEC 77



Above: Looking suspiciously like John McNulty, boss of Modular Technology, is Mr J. McNulty, headmaster of St Baudot's school for the children of mentalists, who took a stand at Compec to present an idiot's guide to data communications. Trying not to look too dim are two of St Baudot's gymknaped mynephews, and readers could be forgiven for mistaking the bearded youth for Nicholas Cornford, John McNulty's right hand man.

RIGHT: A complete contrast to the pure hell of St Baudot's was the cool, classy elegance of the Fungus stand, where most of the goings on were of a non-nonsense businesslike nature — mainly hard talk about the range of DEC oriented systems and peripherals that Fungus builds and sells.



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Launch-pad for UK products

A SIGNIFICANT feature of Compec was the emergence of several new all-British products introduced by small independent companies without benefit of government money. Perhaps the most striking was the elegantly-styled all-black VDU from Pericom. Built around the company's Milton Keynes plant.

"We thought there was room for another UK company making VDUs, particularly at the top end of the market," Ron Cragg, head of Pericom, told Computer Weekly.

"I was very impressed with the stylish French Sintra VDU, which seemed to be featured on almost every other stand at Sibco last year, and I wanted something with nice styling.

"I think we have achieved that, and that overall the 6801 is a strong product. It is not programmable, but it offers all the normal features one expects in a VDU. In particular there is a double page memory for scrolling, it has a true lower-case character set, and we have a strong printer package which enables one of the pages to be used for buffering up printer protocols. And it is completely operator configurable.

"Markets we are aiming at include word-processing and business systems, and the 6801 is available in pre-production quantities now; full production begins February 1."

New from Computer Aided Systems (Sales), specialists in selling commercial systems based on DEC minis, is an all-British business system with its own specially developed programming language. Called Compass, the system has a processor built around one to three Zilog Z80 micros, and includes discs and printers from DRI and VDUs from Cifer.

A fully-configured system supports up to eight VDUs, takes 192K-bytes of main memory, and is programmable in Basic, machine-code and the proprietary CABL language.

CABL was developed by pro-

grammers familiar with Cobol and Dibal, and is akin to languages but has features "never before available on a machine of this size" according to the company.

"The response at Compec has been fantastic," a spokesman told Computer Weekly. "They want to market it, particularly in the North of England and Scotland, and there has been considerable interest from government and other large organisations with their own mainframes have been priced at what can be done on a system of this size."

The basic system consists of the processor with 32K-bytes memory, full-size VDU, two 150Kbps disc drives and a 150Kbps printer, built into a specially-designed British-made desk, and sells for £17,500.

The processor was developed by another British company, Trivector Systems of Wiltshire, and was exhibited by the company as the Triton 3.

The interconnection between the Z80s is via a high-speed triprocessor link; each has its own dedicated memory of 128K-bytes, and there is a 64K-byte scratchpad memory attached to the bus and shared by all the processors.

Micro firms merge

ONE of the UK's home-grown microcomputer manufacturers, Bear Microcomputer Systems of Maidenhead, shared a stand at Compec 77 with Newbury Laboratories — mainly because the two firms are merging at the end of the year.

They plan to open a hobbyist shop at Newbury's premises at Rone Lane, Newbury, and the linking of Newbury's display expertise with Bear's microprocessor hardware/software skills has already produced two interesting offshoots which they showed at Wembley.

One was Micro-Vid, an alphanumeric output display that can hang on to the bus of any 8-bit microprocessor. Micro-Vid comes

with a DMA controller and a 400 line display that can show eight lines of 84 characters, but its most interesting feature is probably its price — £180.

The other product is a £480 personal machine incorporating Micro-Vid and configured around a Motorola 6800. The machine comes with an integral keyboard and is housed in a rugged casing described by Bear as "sturdy proof". The user is provided with 4K bytes of RAM and the machine can be interfaced with an audio cassette recorder fitted with a 300 baud Kansas City interface. This converts digital data to audio tones and was formulated in the US at a Byte Magazine conference in Kansas City.

MICRO NEWS FROM COMPEC

Package for users of Altair systems

APPLICATIONS software for Altair 8800-based small business systems can now be realised with little in-depth knowledge of software and programming, following the introduction of the Insta-User software package by Computer Sense.

The package uses a conversational mode to extract from the user a definition of the files to be originated in the system, the information to be held in each file, the characteristics of each data field, and the rules to be applied in processing them. The software then assists the user to define the format and contents of each printed report which is required from the system. Special functions that are repeated regularly can be assigned a reference number once specified, so as to remove the need to specify the function in detail every time it is required.

The conversational interaction built into the software means that a user can generate an applications package tailored to his own requirements with considerable ease. It also means that once created, the program can be altered to suit new requirements in the same way as it was created.

Computer Sense has quoted a time of two and a half hours for one customer to create a VAT accounting module as an example of the speed of implementation of the software, which is available for £350.

Music making with Model 6

FOR the musically minded, Comput of St Neots, Cambridgeshire, has added the Model 6 music board from Newtech Computer Systems Inc of Brooklyn, New York, to its range of \$100 bus compatible microcomputer products.

The board utilises a 6-bit latching digital-to-analogue converter to produce melodies, rhythms, sound effects and the like, from programs written in Basic.

It comes complete with its own in-built audio amplifier and speaker, and is equipped with a jack socket for connection to an external audio system.

A users' manual which contains instructions for writing the Basic programs, and an 8080 assembly language routine for playing them, is provided.

Compatible with the \$100 bus structure, the Newtech board joins the range of "personal" computer products handled by Comput on a retail and mail order basis. These include Cromemco, Imal, North Star, Dynabyte and Franklin systems.

Extending Micro-File capability

TO meet a growing demand for extended capabilities for the Micro-File microcomputer system, Extel's Engineering Division has produced a combined hardware and software package that doubles the number of terminals that can be used with the system from two to four.

Aiming primarily at the small to medium scale business user, the Micro-File multi-terminal access package enables four operators to use the system simultaneously. The additional terminal ports are located in a small module that fits on to the back of the standard Micro-File cabinet, and each port is equipped with an RS232C interface which allows each terminal to be independently selected for speed, parity and function.

Mycron products introduced into UK

MICROCOMPUTER boards and systems from Norwegian manufacturer, A/S Mycron have now been introduced into this country by Euro Electronic Instruments. The product range extends from a complete Intel 8080-based microcomputer system with dual floppy disc drive, through to a full range of CPU, memory and interface boards. It also includes a range of software products that extends from a one-pass assembler through to a sequential Pascal compiler.

Based on its own board products, the microcomputer system utilises a chassis unit which incorporates its own power supply. In its basic form, it can accommodate up to six double size Eurocards, and incorporates a backbone interconnection motherboard.

Any of Mycron's board-based sub-systems can be used to realise a particular system configuration. These range from an 8080 CPU that includes 1K of RAM, 2K of EPROM, UART channel, bus interface and 2MHz clock output, through a selection of memory cards that include 4K byte static RAM, 16K byte dynamic RAM, 8K byte EPROM, and 64K byte of dynamic RAM, and on to a variety of interface boards that cover such requirements as dual serial I/O, 4 channel serial I/O, two input and output parallel I/O, floppy disc controller, digital input and output modules and analogue input and output modules.

The range also includes a special high speed slave CPU board based on AMD 2901, 4-bit, bit slice devices. This is configured as a general purpose 32 bit microprogrammable module, featuring a 200 nanosecond instruction time, hardware floating point arithmetic, and a 512 by 32 bit word EPROM microprogram memory.

A wide range of software packages is also available from Mycron. The one-pass assembler is designed to be a debugging aid for interactive use, allowing error recovery to be made both during and after actual assembly. It resides in less than 4K bytes, and is broadly compatible with the Intellec-8 Mod 80 assembler.

Other software includes a diskette based monitor, two floating point packages, a text editor, a real time and time sharing monitor, a PL/Micro resident compiler that is compatible with Intel's PL/M, which provides simple and structured statements, constants and data type definitions and entire and component variables declarations.

But whatever the number — the reasons for getting there were undoubtedly the same: a uniquely designed package with superior performance, fewer problems and better technical support.

The company has its headquarters in Oslo and employs only 24 people. It has scored significant successes in the oil exploration business, notably a contract from Siemens for 60 systems used in data collection on oil rigs. Reliability was the reason the Mycron systems were chosen, according to a company spokesman.

Founded by Lars Monrad Krohn, who also founded Norwegian minicomputer Norsk Data A/S, Mycron had a turnover of four million Norwegian Krone (£400,000) last year.

Board assembly is all contracted out, although final testing has to be done in-house. Despite its small size, the company has done business in Scandinavia, the US, Canada and Europe. Application areas for which systems have been sold include train supervision in Ca-

nada, hospital patient administration, laboratory automation and education.

For the future, Mycron is waiting impatiently for the Intel 8086 16-bit micro, but if the 8088 is delayed much longer, may adopt instead the Zilog Z80. The plan is to produce a faster and more comprehensive CPU board as an upgrade for the Mycron 1 CPU board. There is also a fast input/output processor on its way, based on the Z80.

The company was founded on the twin philosophies that hardware is cheap, software expensive, and that the right person to write process control applications is the process engineer and not an applications programmer. Thus, says Mycron, he needs software tools simple enough that he can program easily, and that is what the company believes it offers.

Edited by Martin Banks

Self-study course

THE self-study microcomputer training course produced by Integrated Computer Systems is now being handled in the UK on an exclusive basis by Computer Marketing.

The course, which costs £349, is claimed to be the first to have provided a self-study programme giving hands-on experience of both hardware and software. It consists of a fully assembled Intel 8080 microcomputer card that contains an educational monitor program.

This is combined with a 650 page work book, which covers topics such as hardware fundamentals, a step by step introduction to the 8080 instruction

set, use of the hardware's built-in keyboard and display for program loading and checking, programming for serial and parallel input/output, real time program design, peripheral interfacing and working with advanced mathematical routines.

The exercises covered by the course range from simple routines to illustrate the instruction site, through program debugging problems and solutions to advanced programming techniques.

Computer Marketing, based in Essex, has come to an agreement with Midlestone, of Belper, Derby, for sales coverage in the North of England.

Plessey memory unit

A MEMORY device intended for use with software programmable keyboards has been introduced by Plessey Semiconductors that has the capability to provide up to 380 10-bit outputs.

Called the MP 3802, the device is a read-only memory capable of encoding a total of 90 single pole, single throw key closures into a 10-bit code. Each key can

also have up to four selectable modes.

It is suitable for operation with DC or analogue keys, and data outputs and control inputs are compatible with TTL, CMOS and most other logic families. A variety of customer options can be provided with the device.

All the well known data transmission codes can be used.

CA-SORT

March 1976: 500 Sept. 1976: 900
Sept. 1977: 2000

On the 31st of August this year we installed our 2000th CA-SORT. As it happens, it was at Belgium Shell which operates an IBM 370/138 running under DOS/VS.

We can only guess at how many independent packages designed for 360/370 computers have ever reached this exceptional figure — perhaps 10 or so?

But whatever the number — the reasons for getting there were undoubtedly the same: a uniquely designed package with superior performance, fewer problems and better

technical support. Enhanced regularly over the years, CA-SORT is now honed to near perfection. With Release 5.0, announced recently, it now runs faster and uses less resources than ever before.

Literally thousands of users in 28 countries around the world have been able to stretch limited hardware budgets through savings with CA-SORT.

Isn't it time for you to consider CA-SORT for your centre? Find out for yourself why over 2000 IBM users have already switched from other sorts.

You can evaluate CA-SORT on your system for 14 days without obligation. It takes a mere 10 minutes to install — even less on OS systems — and without any interruption to work whatsoever.

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COMPUTER ASSOCIATES

DATAPRO, a well-known American research organization, conducts a survey each year to determine the most valued software packages in use in the USA. To our knowledge, CA-SORT 7.7, a two-time winner, is the only European package to achieve this coveted award.

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David Tolly

Fred Lamond looks at ICL's mainframe strategy

The ICL 2950 completes the 2900 series in the manner of a keystone in an arch in that it enables the various models to support each other. It links the small 2903/2904 machines, first announced in April, 1973, with the large 2900 models, which were introduced in November, 1974. It also replaces the last of the 1968 vintage 1900 series processors in the ICL product line.

This is a good time to take a look at the 2900 series and see how it compares with its main competitors on the British and European markets. These include IBM's System 32, 34, and 3, the 370, and the 3030; Honeywell's Series 60; and Univac's Series 90 and 1100.

ICL now offers a complete range of modern mid-

1970s designed processors, from the small 2903/20 which competes in price with IBM's System 32, to the large 2904 which is performance-competitive with the IBM 370/168 though not yet the 3033.

The 2900s thus cover a broader range of prices and system sizes than any competing computer series except Burroughs' 800 Series, of which only the small and medium size models are found in Europe, and Honeywell's Series 60.

The 2900's common numbering system conceals a split between two totally different data structures and operating system families. At its lower end, the 2903, 2904, and the 2950 and 2980 systems running under DME perpetuate the old 1900 series 24-bit word

length; memory-to-general purpose register CPU architecture; order code and operating systems. They also provide full object code compatibility with 1900 series systems running under Executive, George 1, George 2, and George 2-Plus and George 3 on the 2980 DME.

On the other hand, from the medium size 2950 and 2980 systems running under VME/K upwards, the 2900 series offers the same eight-bit byte, 32-bit word-oriented data structure that the System 4 offered in 1968, at the time of the ICL-English Electric merger. But whereas System 4 had a similar memory-to-general purpose architecture to the 1900 series, the medium-to-large 2900 machines are built according to a totally

different pushdown stack processing architecture reminiscent of the old English Electric KDF series, large Burroughs 55000, 86000 and 87000 series systems.

So the 2900 series offers neither the homogeneous eight-bit byte oriented data structure of the IBM Systems 32, 34, 3, 370 and 3030; nor the single JCL and high-level language definitions that cover a different architecture of Burroughs 800 systems; nor Univac among ICL's major competitors offers comparable diversity of both data structures and operating systems in its current product range.

IN the years from about 1966 to 1970 some major events in computer education have occurred. The first GCE A-level syllabus in computer science was taught; the Hoskyns organisation produced what was later to become the ICL Computer Education in Schools scheme; the working party on Computer Education in Scotland produced its interim report recommending the establishment of four computer education centres; Hatfield Polytechnic planned and installed its DECsystem-10, of which one third was allocated for school and college use; Basic was invented and crossed the Atlantic Ocean. There were other developments born of tremendous individual enthusiasm and effort in various countries.

Anyone familiar with the organisation and management of British schools would not expect rapid change to follow these early enterprises and the table shows it was not until the mid-seventies that significant changes in the curriculum had occurred (Table 1).

This is a comparatively rapid infiltration of the school time-tables; for better or worse "modern" mathematics took from 50 to 100 years from being invented to getting into the school curriculum. Many other worthy subjects such as cybernetics or psychology still haven't made it.

It is arguable that the efforts of many enthusiastic pioneers — probably the 3,000 or so subscribers to "computer education" — have been rather more productive than one could reasonably expect.

While this modest progress was taking place in schools the universities and polytechnics were responding in their different ways to the challenge of computers. One may argue about the content and effectiveness of their courses, but the courses do exist. So does about £100 million worth of computing equipment which is avoided and replaced at the rate of something like £15 million a year. And £2 million have just been spent on computer assisted learning projects.

In the further education sector progress has been made with courses for operators, programmers, analysts and an impressive range of national certificate and similar courses.

The only sector of further or higher education where progress has been minimal is the teacher training sector.

The effect is that the output of teachers has been cut by about two thirds thereby substantially reducing the potential rate of curriculum reform by new teachers. In-service training has, in theory, had a great boost but, so far, shortage of funds for replacing released teachers in the colleges devoted to in-service work was no twentieth and is to be two ninths by 1980, but it is two ninths of a very much smaller total resource.

All this data is intended to show that, despite the promising events of the late sixties, it is not really surprising that people — even young people — still have depressingly strange ideas about computers. However, things are beginning to happen in the schools at last, and the advent of reliable mark sense card systems and cheap microcomputing power should provide further stimulus.

The simple growth of computer studies as a school subject is no guarantee that the teaching is good, but at least pupils who have completed a CSE or GCE syllabus have experienced computing, and they know that it is essentially the study of information systems rather than a curious offshoot of mathematics.

astonishing ability to survive in ice and snow; Indians for their ability as hunters and warriors, and so on. But Britons, it seems, are not admired for their ability to survive well in our technological environment. "Survive well" means understanding your house, its systems and its contents, including the contents of its garage, to enable you to do simple repairs and improvements, and to know enough to avoid being gyped by an "expert" when a job is too big for you.

A good survivor should also be able to contribute sensibly to decisions in his place of work. It may be difficult to see how non-specialists contribute to decisions about specialised technology, but they do. As an example one may quote the resident sculptor in a college of education who was a member of the finance committee. Another member had presented a case for buying a dual-drive floppy disc system for the college computer. The sum involved was a modest £2,500 but the sculptor could not come to terms with it and ended his verbal attack with a slightly hysterical and quite inaccurate comment: "There'll be nothing left for anyone else."

A cowboy or Indian or Eskimo was probably taught by his parents and their friends but a British child is taught in a British primary school where there is a negligible amount of science teaching, and in a British secondary school where the dominant traditions are still those of the men of letters rather

than the men of science. Thus the influence of the media, as far as the image of computers is concerned, can also be traced back partly to the influences of the educational system. The conclusion is neither revolutionary nor even surprising.

To improve public awareness of computing we need education at school level. But to get this we need to overcome the widespread ignorance of computing.

Roy Atherton, a senior lecturer in computing at Bulmershe College of Higher Education, Reading, discusses this vicious circle and looks optimistically to the future of computer education.

The problem is not confined to computing, but in this field it is particularly acute because the growth of computer usage has been very fast and its nature makes the acquisition of general understanding difficult for most people. Lal Makkar, during a research fellowship at the University of Surrey, coined the phrase "computer awareness," and proposed short courses with tape and slide sequences which would appeal to any age group from 10 upwards. The courses have not yet achieved widespread popularity.

Equally the slow growth of computer assisted learning in schools has disappointed many people. Part of the trouble is that the ignorance and prejudice which are the targets for attack are at the same time the barriers which do not let the battle commence.

If we wish to improve public awareness about computers and thereby, one hopes, improve attitudes and decision making, it is arguable that we should aim at encouraging the growth of examination or other courses in schools. Others would argue for encouraging computer assisted learning in various subjects at all levels of education, but two points are worth making.

First, good computer assisted learning usually requires collaboration between a computer man and a subject specialist, such as a geographer, as well as rather better computing facilities than many schools can get at this time. It is, therefore, a slightly more difficult goal than the encouragement of computer studies itself.

Secondly, when some sort of computing environment has been established, computer assisted learning becomes much easier to develop as a secondary effect. If it is accepted that the target should be to encourage the growth of computer studies in schools, then how can this be done best?

Schools themselves control the curriculum and while the Department of Education and Science and the local authorities can exert pressures there are inhibiting factors. Unlike the Scottish Education Department, the Department of Education and Science does not have a policy, as such, for computer education in schools. However, students of the educational

scene of recent years may have discerned some trends. Only one actual computer man has been appointed to the part of the national Inspectorate responsible for schools. Other inspectors have taken an interest but the view that while computer education is a good

are only part time members of the computing fraternity. The Department of Education and Science is currently reorganising itself and we must wait to see what emerges. Local education authorities also need persuading of the merits of computer education but they are probably getting more enlightened as they learn more about it in response to pressure from teachers and parents.

If the growth of computer education is to continue then the schools need to feel that they can get the resources they need: staff, computing facilities, teaching materials and the right kind of relationships in the area.

Most schools developing computer studies find a need for substantial batch processing facilities complemented by an extensive use of an online terminal or a small in-house system. Only a small proportion of schools which do computing have anything approaching this

dual requirement. It is to be hoped that computer education centres or advisory units can continue to increase in number though, one hopes, not in size. Small centres with low overheads and an educational environment are needed. They should provide a low cost but educationally sound service which includes teaching resources, and contributions to in-service and pre-service training as well as computing facilities.

In particular, they should positively encourage good standards and good approaches to computing such as Makkar's computer awareness materials, or concepts of structure in programming. Part of esteem for computer education in the school curriculum is not far away, but it should be earned by greater efforts in in-service training and better standards. The growth will probably take care of itself.

thing we must be careful not to drain away the already scarce mathematics specialists has been expressed.

The argument does not bear too close an examination but it is used and one would expect it from well intentioned inspectors who have been lifelong specialists in mathematics and

Computer Training: Why 'Old School' loyalties could be costly

The old school of thought maintains that basic systems training should be confined to basics. It holds, for example, that in-depth indoctrination in communications systems and sizing techniques should be made available only to 'experienced' systems designers. A reasonable point of view—if the computer industry wasn't evolving so fast. In fact, progress has been so swift that yesterday's advanced techniques are rapidly becoming today's accepted norms.

This is why ICL's new Basic Systems Training syllabus has a far less elementary look. As you can see: Data Processing Concepts (DPC)—1 week. Systems Analysis and Logical Design (SALD)—2 weeks. 1900 Systems Design and Implementation (SDI-N)—2 weeks. VME/B Systems Design and

Implementation (BSDI)—2 weeks. With this new school of training thinking comes a more far-sighted attitude to qualifications. Our experience suggests that NCC certificate is now a minimum standard to be achieved by attendance at these new courses, although the Certificate can still be taken on completion of training.

Finally, our courses shouldn't be seen in isolation. Subsequent training programmes have been brought into line with our concept of progressive training (the course interfaces are shown in our brochure).

Time moves fast in the computer world, and yesterday's successful training schemes can soon become 'old school'. If you care about the future efficiency of your organisation, you should lose no time in completing this coupon.

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2950 swings into the compatibility gap

prices make it possible to offer 512K byte memories at lower price levels than VME/K, and with it the byte-oriented 2900 series, can become available at these lower prices.

The same considerations have deterred ICL from adopting the Honeywell solution which was to link its byte-oriented Level 6, 81, 82 and 84 machines and the 36-bit word-oriented Level 66, into a common Series 60 by means of a common GCOS operating system with the same JCL language.

GCOS was originally written for the large 6000 series with which Level 66 is fully machine code compatible. GCOS 64, 62, 61 and 6 are smaller and smaller subsets, offering for fewer multi-programming facilities, but a compatible job control language.

That this is no easy task is shown by the repeated slippages in the development of GCOS 64 by CII-Honeywell Bull, whose current facilities still fall far short not only of the original GCOS 66 of which it is a subset, but of the multi-programming facilities that ICL can offer at DME/3.

ICL has thus adopted a third solution to bridge the 24-bit word 290/2904s and the older 1900s into the byte-oriented 2900 Native Mode series. This is the "swing" computer, able to run equally cost-effectively under either data structure and the operating system associated with it. That is the 2950, and that is what makes it so interesting.

In order to be effective as a means of defending an existing customer base, a "swing" computer must start at a price-performance level well below that at which the smaller of the two data structures and operating systems is outgrown, and be expandable to levels well beyond the transition point to the larger data structures and operating systems.

In that way, 24-bit word DME users will convert to VME/K or VME/B in preference to converting to an IBM, Honeywell or Univac system, because converting to VME/K or VME/B does not involve them in exchanging any of their hardware.

In order to implement that strategy, the ICL 2950 has been made more expandable and to cover a larger range of main memory and system sizes than any comparable system at present on the market.

It starts at 256K bytes, equivalent to 32K 24-bit words after taking the 128K byte DME overhead into account. Users of the 2904 would upgrade to the 2950 when they have outgrown the 96K word maximum memory size of their present system; 1902T users would switch when they have outgrown the 128K word maximum memory size.

Both levels are well short of the 2980K word size at which the 2903/2904 24-bit word size begins to be felt as an absolute

constraint on writing any larger programs.

And to persuade 2904/1900 users to upgrade to the 2950 DME, its DME-3 operating system offers more powerful multi-programming facilities, including interactive MAC time sharing, than those previously available under Exec 2 or George 2.

By the time 2950 users come up against DME-3 and 24-bit word length limitations they are still far short of the 2M byte maximum main memory size of the 2950.

The 2950 thus covers a range of main memory sizes, prices and performance equal to those of two or three models on its competitors' product ranges (Table 1).

The systems with which it is competing include the IBM 370/125-2 and 370/138 and even

the lower end of the 370/148; the Honeywell 64/50, 64/60 and 66/05; the upper end of the Univac 90/30, as well as the 90/60, 90/70 and 1100/1.

At the lower end of its price range the 2950 offers better main memory and I/O throughput than its equally priced competitors, and better multi-programming facilities, under DME/3 as well as VME/K, than Honeywell offers on any Level 64 model, or Univac on the 90/30, or IBM under DOS/VS.

All in all, a very cost-effective system to keep the 2,000 or more 2903/2904 users and 1,500 or so remaining 1900 users within the true ICL faith when they need to upgrade. And by providing such attractive top cover, it will help ICL sell even more 2903 and 2904 systems, providing it can produce enough of them.

Start of the S Range

The most significant hardware architectural feature of the 2950 which distinguishes it from the rest of the range is the way it handles input/output and main store access.

Like the rest of the 2900 range (excluding the 2903/2904 series), the 2950 has an Order Code Processor devoted solely to program execution. The 2950, however, has a single Device Control Unit which controls all types of peripherals and communications equipment. On the rest of the 2900 models there are separate controllers for each type of equipment, such as a disc file controller and a communications link controller.

All store access requirements from the DCU and OCP on the 2950 are handled by a single Store Control Unit. On the other models, there is a Store Access Control unit

to satisfy main store access to the various peripheral controllers and a Store Multiple Access controller which interfaces between the main store units and the DCU and OCP.

The DCU and OCU in the 2950 are characterised by features of a so-called "S Range", of which 2980 is the 61.

Over the next few years, existing 2900 models, the 2970, 2978 and 2980 will be replaced by S versions, with S4 at the top of the range.

For the user, this new structural structure will mean more power for less money, precisely because it simplifies ICL's manufacturing process, giving a profit margin.

Which was why Basil Fox was so enthusiastic about the new S models.

Manufacturer	ICL		IBM		HONEYWELL			UNIVAC		
	Model	2950	370/125-2	370/138	64/50	64/60	66/05	90/30	90/60	1100/1
Operating environment	DME/3	VME/K	DOS/VS	DOS/VS or OS/VS 1	GCOS 64	GCOS 64	GCOS 66	OS/3	VS/8	OS/1100
Word length (bits)	24	8	8	8	8	8	36	8	8	36
MAIN MEMORY										
Minimum capacity: —Words —Bytes	32K (128K*)	768K	96K	512K	96K	192K (768K)	32K	256K	128K (512K)	
Maximum capacity: —Words —Bytes	256K (1M*)	2M	512K	1M	512K	768K	1M (4M)	512K	1M (2M)	512K (2M)
Throughput (bytes/second)	10M	10M 20M(d)	4M	3M-14M	4.6M	6.25M	10.6M	3.3M	8.8M	3.5M-14M
INPUT/OUTPUT										
Control by Max throughput (bytes/sec)	IOP	IOP	IOP	CPU	CPU	CPU	IOPs	CPU	CPU	CPU
	2M-4M	2M-4M	888K	2.4M	4M	5.25M	4M	3M	4.6M	4.6M-9M
AUXILIARY STORAGE										
Capacity (bytes) —per drive	60M, 80M 100M or 200M	60M, 80M 100M or 200M	35M, 70M 100M	35M, 70M, 100M, 200M, 280M or 317.5M	29M, 70M 100M or 200M	29M, 70M 100M or 200M	27M, 55M, 78M or 186M	29M, 58M, 100M or 200M	100M or 200M	200M, 400M or 800M
—max online	2,400M	2,400M	1,120M	5,000M	3,200M	4,800M	19,200M	1,800M	3,200M	9,200M
OPERATING SYSTEM										
Multi-programming, maximum number of jobs including time-sharing	Reqd	Virtual	Virtual	Virtual	Real (Virtual in prep)	Real (Virtual in prep)	Virtual	Real	Virtual	Real
	64	64	6	...	4	4	60	7	127	...
	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes

Table 1. Comparing the specifications of the ICL 2950 and its competitors. Notes: *Effective memory 128K to 256K bytes have to be added to this for the DME overhead. (d) Dual-processor systems only.

FRED LAMOND is the European Editor of the *Australian Computer Technology Reports*.

COMPUTER EDUCATION

Improving public awareness of computer use

By Roy Atherton



Roy Atherton

When children are not at school their ideas and attitudes are influenced by the media. They get strange notions about computers from programmes like Star Trek. Gentle lowering of the image of computers and the status of computer people also comes from media men bred in the liberal arts/humanities traditions who confess that their mathematics is poor or that they know nothing about the workings of cars/washing machines or computers.

The confession is meant to sound humble, but there is often a clear lack of real concern or even a hint of pride. Certainly admissions of ignorance about our science-based culture or our electro-mechanical environment are made with impunity by people who would be offended if it were suggested that they were deficient in literacy or general intelligence.

A visitor from another planet, or even some other country, might be puzzled about this. Cowboys were admired for their knowledge of cows and cow-country; Eskimos for their

astonishing ability to survive in ice and snow; Indians for their ability as hunters and warriors, and so on. But Britons, it seems, are not admired for their ability to survive well in our technological environment. "Survive well" means understanding your house, its systems and its contents, including the contents of its garage, to enable you to do simple repairs and improvements, and to know enough to avoid being gyped by an "expert" when a job is too big for you.

A good survivor should also be able to contribute sensibly to decisions in his place of work. It may be difficult to see how non-specialists contribute to decisions about specialised technology, but they do. As an example one may quote the resident sculptor in a college of education who was a member of the finance committee. Another member had presented a case for buying a dual-drive floppy disc system for the college computer. The sum involved was a modest £2,500 but the sculptor could not come to terms with it and ended his verbal attack with a slightly hysterical and quite inaccurate comment: "There'll be nothing left for anyone else."

A cowboy or Indian or Eskimo was probably taught by his parents and their friends but a British child is taught in a British primary school where there is a negligible amount of science teaching, and in a British secondary school where the dominant traditions are still those of the men of letters rather

than the men of science. Thus the influence of the media, as far as the image of computers is concerned, can also be traced back partly to the influences of the educational system. The conclusion is neither revolutionary nor even surprising.

To improve public awareness of computing we need education at school level. But to get this we need to overcome the widespread ignorance of computing.

Roy Atherton, a senior lecturer in computing at Bulmershe College of Higher Education, Reading, discusses this vicious circle and looks optimistically to the future of computer education.

The problem is not confined to computing, but in this field it is particularly acute because the growth of computer usage has been very fast and its nature makes the acquisition of general understanding difficult for most people. Lal Makkar, during a research fellowship at the University of Surrey, coined the phrase "computer awareness," and proposed short courses with tape and slide sequences which would appeal to any age group from 10 upwards. The courses have not yet achieved widespread popularity.

Equally the slow growth of computer assisted learning in schools has disappointed many people. Part of the trouble is that the ignorance and prejudice which are the targets for attack are at the same time the barriers which do not let the battle commence.

If we wish to improve public awareness about computers and thereby, one hopes, improve attitudes and decision making, it is arguable that we should aim at encouraging the growth of examination or other courses in schools. Others would argue for encouraging computer assisted learning in various subjects at all levels of education, but two points are worth making.

First, good computer assisted learning usually requires collaboration between a computer man and a subject specialist, such as a geographer, as well as rather better computing facilities than many schools can get at this time. It is, therefore, a slightly more difficult goal than the encouragement of computer studies itself.

Secondly, when some sort of computing environment has been established, computer assisted learning becomes much easier to develop as a secondary effect. If it is accepted that the target should be to encourage the growth of computer studies in schools, then how can this be done best?

Schools themselves control the curriculum and while the Department of Education and Science and the local authorities can exert pressures there are inhibiting factors. Unlike the Scottish Education Department, the Department of Education and Science does not have a policy, as such, for computer education in schools. However, students of the educational

scene of recent years may have discerned some trends. Only one actual computer man has been appointed to the part of the national Inspectorate responsible for schools. Other inspectors have taken an interest but the view that while computer education is a good

are only part time members of the computing fraternity. The Department of Education and Science is currently reorganising itself and we must wait to see what emerges. Local education authorities also need persuading of the merits of computer education but they are probably getting more enlightened as they learn more about it in response to pressure from teachers and parents.

If the growth of computer education is to continue then the schools need to feel that they can get the resources they need: staff, computing facilities, teaching materials and the right kind of relationships in the area.

Most schools developing computer studies find a need for substantial batch processing facilities complemented by an extensive use of an online terminal or a small in-house system. Only a small proportion of schools which do computing have anything approaching this

thing we must be careful not to drain away the already scarce mathematics specialists has been expressed.

The argument does not bear too close an examination but it is used and one would expect it from well intentioned inspectors who have been lifelong specialists in mathematics and

The vital element in today's schooling

THE Inner London Education Authority is unique among UK local authorities in having the sole function of providing an educational service for the teeming millions of the metropolis. Its officers do not have to concern themselves with the conflicting claims for building sewers and beautifying parks, for lighting streets and disposing of the dead; they can concentrate on the problems of educating seven million people.

Not only does ILEA provide infant and primary schools (about 900 of them), secondary schools (some 200), further education colleges (over 30) and five polytechnics, but there is also a network of adult education institutes, youth centres, sports centres, theatres and even prison education units. Big is not necessarily beautiful and the problems of Inner London are, to say the least, daunting. Nevertheless, the size and scope of the authority enables it to provide services which smaller bodies cannot aspire to. This is particularly true with regard to the computer education facilities which have been built up.

To its credit, the members of ILEA have accepted that computer education should be a vital element of every child's schooling if the population at large is to be enabled to come to terms with a world which will be increasingly dominated by the use of computers. In a period of severe financial constraint it is not possible to implement this policy in its entirety, but considerable progress has been made. Although it is hoped that ultimately we will achieve a high degree of integration in the provision of computing facilities right across the educational spectrum, each sector has different needs. So far, only the

ubiquitous pocket calculator has penetrated the primary schools and the major developments have taken place in secondary schools, the colleges and the polytechnics.

There are three aspects to computing in schools; we are persuaded that it is a good thing to teach children about the computers; we believe that computers can help teachers enrich curricula; and we would like to use computers to help run our schools.

In rather more than 100 Inner London comprehensives, children may opt to take a CSE in computer studies; in a few of these, O and A levels are also available. These courses consist of a section on the history of information processing, usually from the abacus to Herman Hollerith, taking in Babbage and the slide rule on the way, then on to fourth generation computers.

There is a thorough section on the computer and its peripherals and the children learn about the organisation of computer departments. They also learn a little programming, usually in Basic, and are taught in general terms about operating systems and applications programs. The use and impact of computers on society are also dealt with. However, a high proportion, between 20% and 50%, of the marks for the subject are gained for practical course work which may be studies in depth of some aspects of these syllabuses or may be programming projects.

However, possibly of more significance in the long run to the quality of the education we provide, is the fact that we are beginning to use the enormous potential of the computer as a simulator to support teaching in a number of subjects, notably in mathematics, physics, chemistry, biology, geography

and economics. One barrier that has to be overcome is the widespread impression that computers can only be of help in mathematics, but once the effort has been made to write the necessary programs and backing up material the motivating effect on children justifies the effort required.

Much remains to be done in this area. Few teachers have experience of computing before starting to teach, and in this computing is unlike other subjects. For this reason our

DEREK ESTERSON, the Inner London Education Authority's Inspector for computer education, describes how his authority is striving to ensure that computer education is a vital element of every child's schooling.

Any opinions expressed in this article are Esterson's alone and should not be taken to represent those of the ILEA.



in-service training programme is particularly important, and teachers are encouraged to attend both residential and non-residential courses. A vital element in these courses is the study of real applications under the guidance of experts from the data processing world.

In school administration there are a number of schemes at various stages of development for pupil record keeping, curriculum analysis, computer managed learning, automatic production of statistical information and reports, and of course, school time tabling. This last has consumed considerable resources over the past 15 years and none of the three

approach contains a large element of interactive access, particularly during editing the phases of the construction of a school timetable. However, we lack the resources for satisfactory implementation of any of these schemes for all our schools.

Computing in Inner London colleges of further education is not yet highly developed. A few colleges have received obsolete cast-off machinery and the City and Guilds O and A-level courses are available at some colleges as well as National Diplomas and Certificates. We have a number of so called link courses in which colleges co-operate with nearby schools in the running of courses. The application of computers in commerce and industry is so far largely neglected.

This brings us to the computing facilities we have succeeded in providing for the colleges. In mid-October, 1977, a 48-port Digital Equipment PDP-11 was installed at City of London Polytechnic for the use of Inner London schools. By the end of the current financial year about 140 secondary schools will have been equipped with printing terminals. The majority of these are teletypes, but there will be about 25 300-baud keyboard printers.

The network has in the past been based on the use of dial-up telephone lines but we are beginning to change over to dedicated lines in order to contain communication costs. A 32-port Hewlett-Packard 2000F, previously used by the schools, is being upgraded to a 2000 Access configuration, and online computing laboratories are being set up in the colleges. The number of terminals at these laboratories will be eight, four, or one according to individual needs, and will include keyboard terminals, VDUs, card readers and graph plotters. Connection to the

central computers facility will be by a mixture of dial-up and dedicated lines, and there is to be a back-up courier service by van for batch work.

From a technical point of view an interesting feature of the central system will be the way in which users gain access. Two 32-line Datel "bureaux" and all the dedicated lines will be connected to a processor which will route users to either the DEC or the HP machine. Full contention and a range of line speeds will be provided and other computers can easily be added to the network.

Nor has the microprocessor revolution left us untouched. This year six or seven schools are likely to have micros. A few intrepid pioneers have purchased kits, but in general we insist that schools should have professionally constructed machines because, apart from considerations of safety, we must attain a high degree of standardisation in order to ensure satisfactory maintenance and a flexible system of software exchange.

It seems highly probable that by the early 1980s the hardware and software development of microcomputers will have stabilised sufficiently for us to base our school and college systems on them while maintaining an appropriate central service for those tasks beyond the scope of the local machines. This will enable us to escape most of the consequences of ever increasing costs of communication over telephone lines.

In a small number of schools and colleges outside our own authority which have already installed microprocessor systems, we observe profound

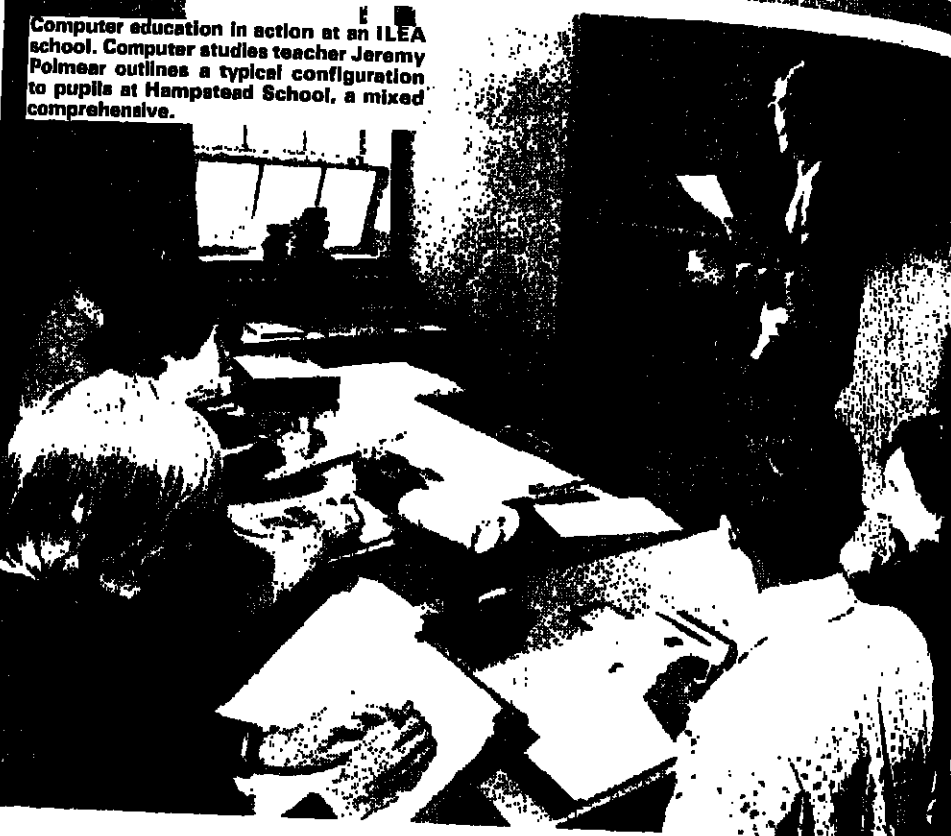
differences in the motivation both pupils and teachers. Remedial English to music, mathematics to geography; teachers are discovering that in-house microcomputer resources enable them to get to pupils in a way which is always possible using other techniques.

However, the systems are yet very robust and depend on the availability of a competent colleague who is able to solder an iron or instantly discover a previously undiscovered bug. So, for the present, we are obliged to maintain a centralised network carrying out experiments, improve the reliability and use of the new systems.

Naturally the complex needs of polytechnic problems of a different magnitude. In Inner London there are five polytechnics until recently computing developed in a piecemeal fashion. The unsatisfactory state of communication equipment and of network software, allied to financial constraint, led to a polytechnic developing to some extent in isolation. Its systems based on two 1902As and a 1905E installed and remote job stations to the 1905E, backed by a van courier service, rather primitive facilities.

The provision two years ago of two DECsystem-10s enabled us to make available interactive facilities to all five polytechnics and pointed the way to an integrated system in which, for the first time, our students

Turn to page 17



Computer education in action at an ILEA school. Computer studies teacher Jeremy Palmer outlines a typical configuration to pupils at Hampstead School, a mixed comprehensive.



THE Plato system was conceived at Illinois University and subsequently supported with funds from the National Science Foundation and Control Data Corporation. The development has been continuing for over 15 years and the software and hardware have constantly been re-assessed in the light of the advancing state of the art.

The present system is in use at the university and over 100 other educational institutions connected to the university. Over 1,000 Plato terminals are connected to the Illinois system and half of these are in simultaneous operation during any working day. A similar system has been installed by Control Data in Minneapolis and connections have been made to that system worldwide.

Although there is a continuing development programme to lower the cost and to take advantage of new technology such as microprocessors; cheaper communications; lower mainframe costs and cheaper memories, these are being introduced without significant changes to the existing services. The Plato system is a fully developed service which is limited in its exploitation by the creativity of its users rather than the technology itself.

The original concept for using Plato as a tool in teaching has been preserved throughout its development. Illinois is still seen as the source of much creative development and Control Data recognises this and collaborates closely with the university. In any teaching process there are a number of inter-relationships which need to be described before the adaptability of Plato can be fully understood.

In a teaching institution, there is traditionally a hierarchy of

Plato's role in a responsible society

responsibilities between the head and the student and it is convenient to label these as the principal, the department head, the instructor and the student. There is a need for close personal interchange between the various levels, for example, the student must interact with his department head.

When one considers the materials used in the teaching process, these are often found to be presented to the institution by an education authority. They are distilled from the immense variety to a sub-set from which the institution may choose.

The variety of materials, be they books, films, computer assisted instruction or other aids will have been produced by individual authors and may have been subject to some ordering process by a curriculum designer, who endeavours to produce a scheme of inter-locked materials that may interest the education authority. Around all this activity are the examining bodies which assess the products of the educational process — be they for jobs, university entrance or the acquisition of degrees.

It is quite apparent in the present world that there is little inter-relationship between, say, the instructor and the material authors or the curriculum designers. The timescales of the present system are too long to allow such an inter-relationship to be fruitful. Text book production today often takes several years while the scripts pass through a major assimilation process in the corridors of power of the education world.

Plato has established a means of communication that inter-relates all these various bodies. It has been created in such a way that the inter-relationships are a

natural outcome of the communication principles adopted by the Plato designers. In essence, it has taken the principle that information presented to anyone connected to the system is best considered as a lesson.

Thus, if a student leaves information for an instructor this is considered as part of a lesson. If a body of students criticises a particular lesson and presents its notes collectively, what is then created is inevitably a lesson for the instructor. He will acquire knowledge as a consequence of these notes which will enhance his abilities as an instructor.

The same concept is preserved throughout the Plato system and there is easy inter-relationship between the bodies mentioned above. We now find that authors of lessons can rapidly obtain experience of new tech-

other activities. There is no difficulty now in conceiving a similar set of relationships that would exist for, say, a manufacturer of home appliances.

The authors are now a combination from research and development and manufacturing; the curriculum designers from product planning; the educational authority becomes senior management and the executive line becomes the line from the sales director to the junior salesman. The examining body could be replaced by the finance director. The inter-relationships between these bodies are, in essence, very similar to those in an education environment.

If anything, they are more rigid, simpler to emulate and more able to use a computerised relationship approach. The experience of Plato is already

has covered the whole development of Plato and has forced a major integration between the hardware and software interface with the user. It has been well known that graphical and pictorial presentations are highly stimulating to students and from the outset the Plato terminal has been heavily graphically oriented.

The terminal is designed for easy use, being a traditional typewriter keyboard with a number of additional keys and a non-flicker touch-sensitive screen. Lessons are written in a language specially created for Plato which ensures that those with ideas can create their lessons with minimum recourse to other specialist help.

The system is further enhanced by facilities for including online consultants who can advise authors on the preparation of their lessons and this facility is extended so that an author can instantly communicate with another author on the system or leave messages for one who has a registered address or sign-on.

An author can start small and explore the lessons that reside in the system which explain the various capabilities, gradually extending his own abilities and learning how to create better lessons. Many lessons, which already reside, can equally be explored for ideas and concepts.

The terminals are connected to a centralised Control Data Cyber computer equipped with a large memory and backing store. The response time is kept to well below one second and every advantage is taken of a deep understanding of the nature of an inter-personal communications load rather than the traditional computa-

tional load. Although, the system is optimised around its use as a tool for education, there are many facilities which can be used in a traditional sense such as calculations, data storage, data manipulation and many others.

For many who are used to the rigid conventions of any interactive computer system, the use of Plato can seem like a liberation. For those who are burdened with large scale scientific computation, Plato cannot offer a comparable service except that in many instances the data manipulation that often circulates within such development could benefit from the human interface built into Plato.

An international network of terminals connected via satellite from Europe to the US is being established. This will be followed by the installation of Plato systems in many countries. The UK is now connected with a terminal in one of Control Data's London offices.

Plato is the state of the art in bringing computing to the natural habits of society. It offers a convenient, additive and entertaining way of conducting relationships that without Plato seem clumsy, slow and prone to faults. All forms or organisations will see in Plato a resolution for many of their internal training and communication problems, and to many of their relationship difficulties with the outside world as the information stored within Plato increases through use.

Plato is the beginning of a new approach to introducing computers into society where the accent is on the responsibilities inherent in that society and not on the limitations of the computer.

The Plato computer assisted instruction system from Control Data is now being introduced to Europe. NEIL SPOONLEY (pictured above), regional manager of education services, describes the system and shows how industry, as well as education, can benefit from the way Plato improves relationships between students, teachers and examiners.

cribes the system and shows how industry, as well as education, can benefit from the way Plato improves relationships between students, teachers and examiners.

niques that they may have introduced. They have direct access to a pool of students; they can get instant feedback; curriculum designers can discuss changes with authors; department heads and educational authorities can work hand-in-glove with the material creators.

This so far has been the basis of the Plato development and it is, perhaps, now being seen that the creation of this tool in an educational environment has been so complex that it encompasses, as a sub-set, the inter-relationships that exist in many

being seen by industry as something far beyond a training or educational tool, rather as a device which integrates the manpower training requirements with the whole of the company management. Resource management can now take on a role of much greater significance in its relationship to company success.

No successful educational process assumes a high motivation on the part of the student. The process itself must be attractive and even addictive to the student. This understanding

Vital element in schools

From page 16

would be able to get quick access to modern facilities. Almost from the start, the new machines were heavily overloaded; financial restrictions

had obliged us to underpower them.

At the end of 1978 the 1905E will be withdrawn from service, and we are currently engaged in deciding on a replacement. This is an opportunity to further

develop interactive facilities and to move towards an inter-polytechnic network.

Ideally we would like to make each node of the network a centre for some aspect of the work, be it specialised packages, graphics or, say, production control techniques, so that facilities don't have to be duplicated (not to say provided in quintuplicate!). We have a number of problems to solve, not least of which in the current climate is finding the necessary cash. The management of an integrated system by teams of people understandingly jealous of their independence within each polytechnic will require tact and compromise.

The method chosen to implement the school and college systems make it easy to add them to the network but there are bound to be conflicts of interest in the competition for prime time. Already some schools' projects, such as a computer managed mathematics scheme, which is too big for the school's computer, are difficult to accommodate without prejudicing the service to the polytechnics.

The logistics of arranging to use our computers for time-tabling 200 schools are daunting. Nevertheless we have the prospect of using computers within the education system to improve the quality of education in a wide range of subjects (and who can deny the need for this), while providing tuition which is relevant to the modern world and may enable us to produce people with the right background and training to make the most efficient use of modern equipment.

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BBC



Picture by Mark Gazon.
The quality of end user education can make or break a new computer system. NIGEL LAURIE, director of the consultancy Communication Audit, offers some practical advice which can make success more likely than failure.

System success via end user training

EXPANSION is widely welcomed in computing as in much else. But growth brings problems. A new application means new end users. And new end users mean fresh demands for user education.

The need to educate these users has been admitted for some years. Remedial education in computing concepts is now plentiful and often good. But training in system use is harder to do well and the task often falls to DP staff.

At least three factors hinder the success of end user education today.

At the outset, many users do not want training at all, but only its results. They demand knowledge but not the work of learning. Hard-pressed managers often lack time to learn all they might; and sometimes acquire less knowledge than they need.

Indeed, in user education at senior levels, providing no less than users need and no more than they want is perhaps the hardest task of all.

A second hindrance to user training is the impact of computing itself. New systems can threaten users. They can erode status, make work dull or make it complex. They may displace a worker's hard won skills.

Finally, the growing range of user needs poses new problems. The more systems embed themselves in work, the more varied users will be.

The problems, however, can be tackled. Here are 10 practical guidelines which should be considered before investing in user education:

1. Users are individuals. Users are like any mass audience — a crowd of individuals. They can be grouped in many ways; by age or rank, job or education.

The key to success in user education is to group users by their training needs. Other factors matter, of course, but training needs matter most of all.

2. People learn what they need — not what they are taught. It is easy for any trainer to feel he knows best. He knows the techniques and knows he can stage an effective "learning experience". But training cannot succeed through technique and skill alone. A simple flaw prevents much training achieving the success it might, and that flaw is that the right techniques are used in pursuit of the wrong objectives because trainee-needs have been poorly understood.

It pays always to go and ask trainees precisely what they feel they need to know about a new system. Doing so keeps training

practical. And it can uncover attitudes which block learning.

User needs vary. But there are three areas which workers confronting new systems tend to worry about:

- a) How will this system affect my job? Will it help me work better and make my work more rewarding? How can I make it do so?
- b) How does it fit in and contribute to the organisation?
- c) Can I trust this system?

Different users will pose these questions in different ways. User education should aim to answer them all.

3. Define objectives. Objectives keep training down to earth. They keep it in sight of success by preventing it trying to achieve too much. They focus on what people do, on behaviour and not states of mind.

When you state the objective of training or education you answer the question "What should people be able and willing to do differently as a result?"

Much money is spent when this question cannot be answered or on events for which no realistic answer can be given. Yet objectives are as vital for "appreciation" sessions as for programming workshops.

4. Make techniques serve your objectives. Many training techniques are in use and costs can vary dramatically. It is easy to be seduced by new "hardware" and "software" (jargon for "projectors" and "slides") but the experience can turn out to be costly even if pleasant.

Lectures, in contrast, may be mediaeval but they have their uses and sound and vision usually keep in step. The discovery approach to learning has great strengths, but sometimes rote learning works better. Business games are fun but results remain to be seen.

In this minefield the answer is to think through with care how the techniques will serve the objectives. Consider what you in the past and ask current users if there is any doubt.

5. The biggest problems occur outside the training room. It is easy to hope that once objectives, contents and techniques are settled, training will have a clean run. This mistake explains fiascos in many fields.

For what happens outside the training session matters no less than what happens within it. And by their nature, the challenges outside are the toughest to handle.

In DP, problems for training can be created when the system is designed. They can be multiplied by failures in user aids and support.

If the system is not built to be usable and if support material is written late and in haste, then user education will have an uphill task. It will have to carry a corrective burden it cannot hope to bear.

To help prevent such problems the user manuals should be written first. Then the system can be built to meet user needs in a usable way. And user education can be planned at an early stage.

6. Consider teaching through the design process. Involving users closely in design helps ensure systems are easy to use.

It also offers a chance for users start-up training at the same time. It could be employed more often than it is.

7. User education is not development. Training usually today's tasks is not enough. For systems, as we know, change and expand; user needs and ambitions grow. Sometimes even additional sets in.

Since change is frequent, education cannot be complete in a day. A sound approach limits the objectives of training; it sets out to get the user started and equipped to learn more for himself.

8. Exploit the grapevine. Every manager knows the organisation charts are one thing and the way communication flows is quite another. But this fact is often regretted when it ought to be exploited, for the best teaching is often given through informal channels.

In user departments, enthusiasts spring up. They become the most effective trainers one could hope for. As users they know user-needs. As enthusiasts they know the value of computing and the commitment shows.

They are natural links between user functions and — perhaps the middlemen — tomorrow. And they can persuade ambassadors for computing among new users.

They are a resource all too often ignored.

9. Look out for the incompetence trap. Like a tragic poverty trap, this is a vicious circle.

The less a user has learnt, the less he will gain from the system — and the less he will come to value it. The less he values it, the less time he will want to spend learning. And so he reaches the threshold where effort he makes pays off in benefits which encourage him further.

10. Build an employee education strategy. With user computing growing fast, employee education strategy makes good sense. It should be a three-year rolling plan to make the organisation safe for computing.

Work should start with a review of current system plans (including office systems) and employee understanding of DP. Then a map of skill and knowledge needs among staff for the next three years can be drawn.

Some will need simply an overview and the chance to see VDU — to overcome sheer ignorance. Others will need training to operate new systems. Whatever the needs, a master plan will help to ensure they are tackled in good time and at the lowest total cost. Without a strategy, education tends to be ad hoc, solving today's problems but ignoring tomorrow's surprises.

One surprise may be how much employees know about computing and its impact. Most DP managers will have a good feel for this but where doubt about employee attitudes exists, data should be gathered.

A systematic survey of a small sample is the most practical and reliable start. Then the education strategy which will give the results in the years ahead can be built.

And a strategy is a long-term task for today's education — it is to prepare for tomorrow's system.

The untapped enthusiasm

GROWING enthusiasm among school children for computing is being wasted because of the shortage of people who can teach the subject to an advanced level, and a lack of awareness of computing in schools.

This is the view of Andrew Parfitt, who has switched from being a mathematics teacher doing a little computing at Hackney College of Further Education to a full-time lecturer in computing at the college. The shift of emphasis was due to demand from students for more effective instruction in computing subjects.

"Schools can offer CSE

courses," he says. "A few offer O-levels and fewer still A-levels. The main problem is staffing. The maths teachers with a little computing knowledge are told that they are now the computing teachers."

"The enthusiasm is there among the pupils but it can't be tapped. Computing is coming in by the back door and has not established itself yet. If it had not been for the enthusiasm of my students I would have given up long ago."

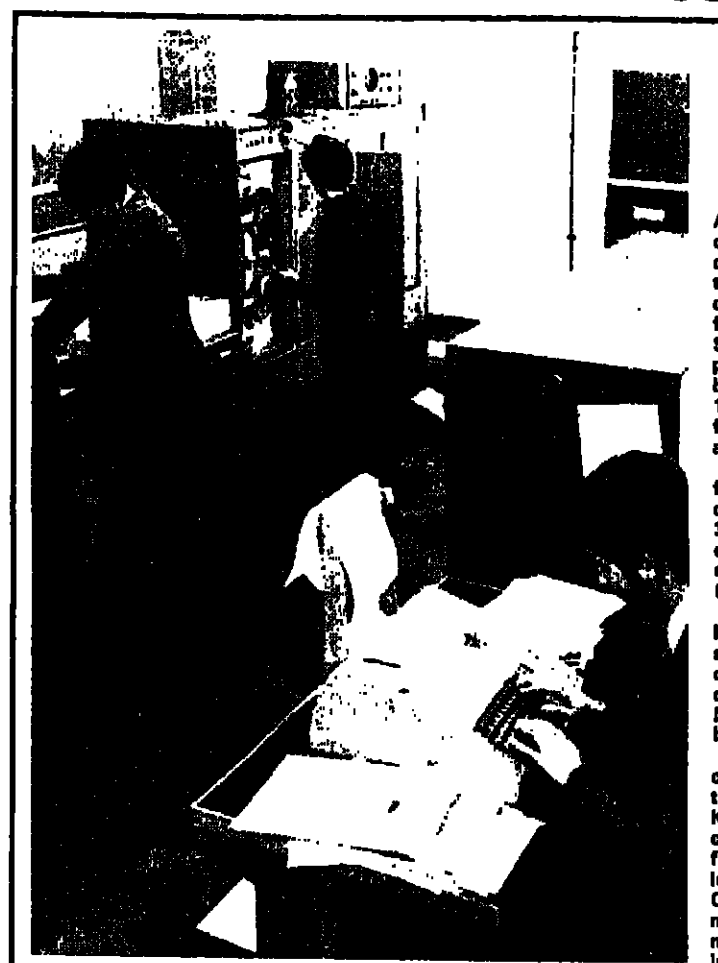
Parfitt's points are endorsed by the fact that whereas nearly 100 schools controlled by the Inner London Education

Authority offer CSE courses in computing, only five or six offer O and A-levels.

The ILEA points out, however, that the O-level has been available only for a year. And that it takes time to train teachers in a new subject. There are four or five teachers under the ILEA who specialise in computing.

The ILEA questions the value of computing specialists, pointing out that if other disciplines are to be encouraged to use computers it is perhaps better for a number of teachers to do a little computing. And having one specialist poses problems if he or she leaves or is ill.

One of the problems of teaching computing is keeping in touch with the industry, says Parfitt. "I have no practical experience. I rely on reading Computer Weekly or hearing from old students who are now operators."



Power to the school room

A BUSY computer room, with operators loading tapes and discs and driving the machine through the console... but this computer room is a bit different, for it is run by pupils at Shrewsbury School, an independent school of about 600 boys. The computer is an ICL 1902, donated by a Sheffield firm and brought into service and maintained by the school.

The system has been running for over a year, with only occasional help from ICL. It has 32K of memory, two EDS 8 disc drives, giving 16 Megabytes of storage, four tape drives and a 600 lines per minute printer.

This sort of power means that boys get a turn round of a few seconds, submitting their jobs on paper tape and collecting the output straight from the printer. More ambitious boys use disc based compilers.

The effect of having a computer at school is shown by the fact that one pupil, Mark King (seated at the Teletype console), was taken on by ICL for a couple of months between leaving school and going to Cambridge University. Within a month he was an operations manager and he set up a 2903 installation from scratch.

Cure for shortage of teachers

A BIRMINGHAM COLLEGE has introduced two courses for teachers which should go a long way to curing the shortage of computing teachers and schools' ignorance of the subject, two problems highlighted by Andrew Parfitt of Hackney College of Further Education (see above).

Westhill College has just started a BEd degree course on mathematics and computing for teachers who want to add to their qualifications.

The three-year, part-time course is aimed at producing people who can teach computer studies with authority to A-level standard.

Another new course offered by Westhill is for teachers with

at least five years' experience who aim to become advisers on computer education for their local authority. The diploma course in computer education, believed to be the only one of its kind in the UK, covers the computer in society, computer assisted learning, packages for schools, and the role of computing in the curriculum, as well as practical programming and systems analysis.

This course runs for one year on a full-time basis or two years as a part-time course. It is recognised by the Department of Education and Science.

Further details can be obtained from The Principal, Westhill College, Weoley Park Road, Selly Oak, Birmingham B29 6LL.

First export orders

FIRST export orders for ICL's 2903 Education System are among a batch of seven orders taken in the last four months.

The overseas orders are from Darwin College in northern Australia, and Limerick Institute of Higher Education in the Republic of Ireland. Both will use the system for teaching and for administrative jobs.

UK orders have come from Dorset Institute of Higher Education, which is to provide online computing for Dorset schools; North Gloucestershire College of Technology; Highbury College in Hampshire, which will also serve schools

and aims to link systems with the 2960 at Portsmouth Polytechnic; Preston Polytechnic and Liverpool University.

At Liverpool the 2903 will replace card punches and be used both for data entry by students to a 1966S and as a stand alone system.

ICL says the fact that these orders have been placed in very hard financial times is an indication of the company's continuing strength in the education market. Since the education system was launched last year (CW, May 8, 1976) 20 orders have been placed, and another 20 orders are expected.

Compower expands

PENETRATION of the Middle East market and the introduction of a 20-week course which combines classroom teaching with on-the-job coaching mark a substantial expansion by the training division of the National Coal Board's bureau subsidiary, Compower.

Compower has been taking foreign students for four years in a small way, but now expects to take up to 50 a year. Saudi Arabia and Libya are its biggest markets, although it has dealt with Kuwait and is considering Nigeria.

"The UK is very well regarded

in the education field," said Edgar Willie, head of recruitment and training at Compower.

The new course for UK staff, launched this week, starts from scratch with two weeks of computer appreciation and three weeks of basic Cobol. Students next spend 10 or 12 weeks writing programs for their company, with tutorials at least once a week. They then return to Compower for an advanced Cobol course.

The course costs about £130 a week for the full-time classroom sessions, excluding accommodation.

Midlands competition

SCHOOLS in the West Midlands are being asked to find a useful and original application for computing in a school, the community or local industry in a competition organised by the Computer Education Group.

The group's aim is to encourage the use and development of computer education in schools. Local firms are being asked to

contribute to a prize fund so that the winning school can provide or improve its computing facilities.

The competition closes next May. Companies wishing to contribute to the prize fund should contact Diana Burkhardt, Computer Centre, Birmingham University, PO Box 363, Birmingham B15 2TT.

COMPUTER WEEKLY
presents a special one-day conference
Solving the computer staff problem
The Cafe Royal, Regent Street, London
Thursday, January 19th, 1978

Objectives:
To provide DP Managers and Personnel Officers of firms using computers with an overview of current practice in the recruitment of computer staff.

Shortage of computer staff is a problem which faces all computer users. A lack of qualified personnel is exacerbated by the mobility of computer people and their apparent loyalty to the job rather than the organisation.

In these circumstances recruiting suitable staff poses particular problems: How does the user set out to attract staff? How does he advertise effectively? How does he manage the selection process? Should he use a recruitment agency? Is the use of contract staff a viable solution?

The seminar will seek to answer these questions and to indicate what the computer user should do in order to formulate a successful recruitment policy.

Session 1:
Introduction. The computer scene and computer people. Who are they? What are their characteristics? How are they motivated? Can they ever catch up with demand?

Session 2:
The user's viewpoint. Finding a way through the recruitment jungle. How can the computer user act effectively to obtain the staff he needs? How should he set about recruiting staff? What are the pitfalls? Planning staff recruitment and development rather than reacting to crisis situations.

Session 3:
The role of the recruitment agency. Identifying users' staff requirements. Specifying the post. Giving the user the benefit of specialist knowledge of the job market.

Session 4:
The NCC Job Selection Service. Systematic tests to assess applicants' qualities can provide a standardised basis for selection when compared with national norms — thus providing a useful aid in the selection process.

Session 5:
How to advertise for computer staff. Specifying the job and the working environment. Writing the advertisement. Adopting a creative approach to job advertising. Media selection. Maximising response.

Session 6:
The DP Manager. Picking the right man for the most responsible job in the computer dept. Fewer in number than other categories of computer staff, the post demands a more generalist, less specialist approach than programming and systems analysis and a wide ranging knowledge of the business. Filling this key post is a task for a reputable recruitment bureau.

Session 7:
Contract Staff. Increasingly contract staff are being used to overcome work bottlenecks, help in conversion programmes, etc., as well as compensating for variations in staff availability due to holidays and sickness. Now the use of contract staff is such a well-established feature of the computer scene that it merits inclusion in an overall appraisal of the recruitment problem.

Session 8:
Maintaining standards in the recruitment business: What are its aims and achievements? A consideration of the code of conduct.

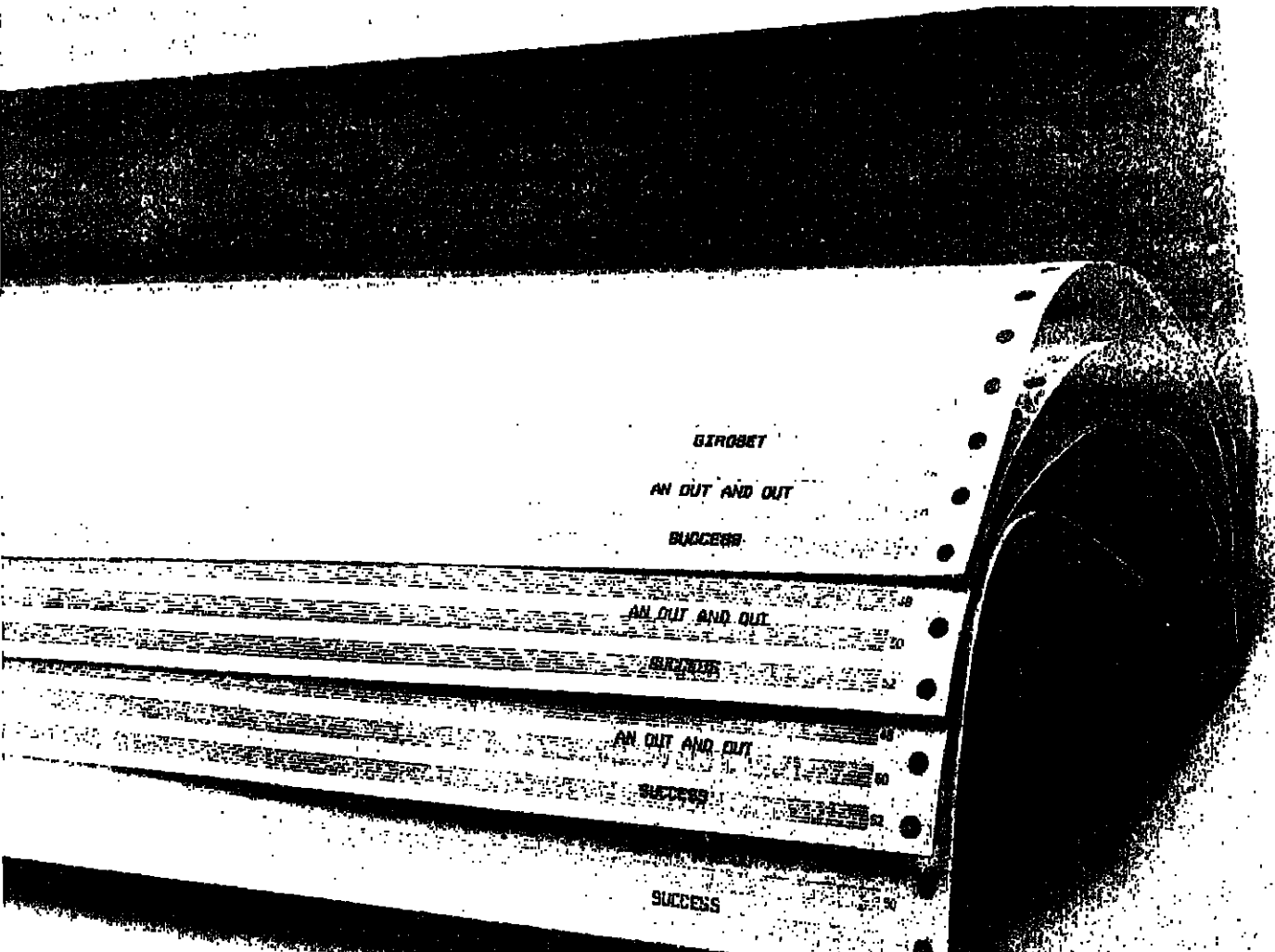
The speakers will include Tony Miller of Furness Witby; David Payne of Tascos; John Wood of EIMS; George Penney of the NCC; John Goldsmith; Ian Humphries of Knight Computer Services and Neville John of OCC, chairman of the CSA Recruitment Division.

Please return coupon to:
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Please reserve... place(s) at the "Solving the computer staff problem" conference to be held at the Cafe Royal, London W1, on Thursday, January 19th, 1978.
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CW/DPMA workshop

Date: December 1
Venue: Holiday Inn, George Street,
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Price: £15 plus VAT (£10 plus VAT
for DPMA members) including
lunch and refreshments.

COMPUTER WEEKLY in conjunction with the Data Processing Management Association is organising a workshop on December 1 aimed at improving the skills of DP management in communicating with end users. The workshop will be given by Nigel Laurie, who has more than 10 years' experience in the communications and computer fields. The last in his current articles for Computer Weekly on DP/user communications, which will form the basis of the

workshop, is on this page. Numbers are limited to ensure that all delegates are able to participate fully in the day's work, but if there is sufficient demand, further workshops will be held.

In order to ensure that the workshop is tailored to DP Management's real needs, the DPMA is currently conducting a survey of its members on DP/user communications. Survey forms can be obtained from the DPMA, 27a York Road, Maidenhead, Berkshire SL6 1SQ. Tel. 0628 29879.

If you would like to attend the workshop, please complete the form below.

I wish to order ticket(s) at £45 plus VAT (at 8%) for the CW/DPMA workshop to be held at the Holiday Inn on December 1.
DPMA members can apply for reduced rate tickets via the form that is being sent to all DPMA members.
Cheques should be made payable to IPC Business and Industrial Training Ltd.

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If you are interested in attending any future workshop because the December 1 meeting is full or is inconvenient, tick here ☐

Return this coupon to Computer Weekly/DPMA Workshop, IPC Business and Industrial Training, Throley Way, Sutton, Surrey SM1 4QQ.

DP/user communication Part 5

by Nigel Laurie

What Bangladesh has taught us

EVERY DP manager these days is what jargonisers would call "an agent of change." He needs to get new business systems accepted — and working. He needs not just user understanding but user consent — and then user satisfaction.

The problem is hardly news and certainly not unique. It's a subset of the worldwide problem of getting innovations accepted. The challenge the DP manager faces is not so different for instance from that of promoting rural development in the underdeveloped world — say in Bangladesh of the 1980s, a country ravaged by disasters, laid waste by civil war and hit by political turmoil (the subject of a recent and significant report).

The Comilla Rural Development project in Bangladesh was a vital exercise with an aim familiar to every manager: to mobilise people to use their resources better. How the project staff tackled it and what they learnt can tell us much about making change happen.

1. They exploited accepted communication systems. To start with, the project leaders did not use mass media from "outside" to win over and instruct the villagers. They used communications systems and resources which were already proven. They found opinion leaders — accepted, trusted and

good communicators — and used them as go-betweens, explaining the project to the people. They used the traditional village meetings — in the traditional places — instead of new occasions.

2. They talked to the grass roots. The development experts made face to face contact with the villagers — on whose cooperation the project depended.

As work progressed they found that direct feedback was vital from the villagers themselves. They had to bypass the bureaucracy to get an authentic feel for the problems facing those working most closely with the new methods.

3. They made communication practical. The developers did not promise the earth. Since the communication was personal, it could be precisely tailored. It focused on the needs and knowledge of the villagers. It related all messages to activities the villagers could perform.

4. They kept expectations low. If a new development had not been proved locally and if supplies and services were not yet available, it was not mentioned. Promise did not exceed performance. Frustration and disappointment were avoided.

5. They found communication needs changed. As the project got under way people's information needs grew. The first problem had been to get through to the rural people and win them over. Now the problem was one of meeting their growing need for information. Face to face communications broke down from overload. It couldn't be used to carry all the details in complete and accurate form. More formal channels were needed. A strengthened communication system was required.

The comparison shouldn't be drawn too far of course. But the lessons from Bangladesh suggest that the daunting problems

of making new systems work smoothly can be overcome if user communication is managed with skill. The success in Bangladesh suggests the following:

● If you want to sell something new — communicate through channels people know and trust.

● If you want to keep credibility with users — relate all information to their practical, exact needs.

● If you want to control expectations — use personal communication systems.

● If you want useful feedback — get it direct from the end user.

● If you want satisfied users — keep a check on their changing communications needs and a personal and formal channel. The personal links can supply vital detail.

"Communication and Rural Development in Bangladesh" published by East-West Communication Institute, Hawaii.



Filetab teach-yourself

A teach-yourself course on Filetab, the National Computing Centre's report generator and file maintenance package, is now available from the centre for users of ICL 2903 and 1800 computers and IBM 360 and 370 systems.

The course comprises an audio cassette, an introductory booklet, a workbook, a programmer's reference manual and an applications study guide with 13 practical problems. The workbook has seven sections, each beginning with a test which enables the student to see if he or she already knows enough about Filetab to skip the section.

A one-day workshop is offered to students who complete the course.

The course costs £400 and includes five sets of the materials. The NCC is at Oxford Road, Manchester M1 7ED, telephone 061-228 6331. ● A student is pictured left using the Filetab learning module.

Distribution network from H-P

A "BUILDING-BLOCK" approach to distributed computer systems was announced by Hewlett-Packard in Grenoble last week when it introduced its HP Distributed Systems Network concept.

A challenger to Digital Equipment's Decnet system, it consists of new hardware/software that links HP DS/3000 and the new DS/1000 systems, as well as enabling the HP 2028 data entry systems to communicate with the DS/3000.

Functions in the network are layered, or isolated from one another, so that future developments can be added without altering the procedures that users have based on present-day HP networks. Changes can, therefore, be made in one function, such as communications methods, with little or no effect on other functions, such as user applications.

Already there are about 200 HP DSN users worldwide, and the company says that future products will handle HDLC, SDLC and X25 standards.

Redifon grows with Czechs

FORESTRY and timber are one of Czechoslovakia's largest growth industries, says Redifon — and the growing of Czechoslovakian trees is winning the British company growing business.

The country's State Forestry Commission already had two Redifon Seecheck data entry systems, and has just ordered a third, with 32 terminals, for the South Moravian Forestry Commission, based in Brno. It will be used to prepare data for the new Rjad mainframe on its way from the Soviet Union.

CAD 78 the event for designers

CAD 78 is the third international conference and exhibition on computers in engineering and building design.

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As a member of an advanced technical services group in this young go-ahead life assurance company, your task would be to help develop software in a DGS/VS, VSAM, GRASP/VS, SHADOW II or LIBRARIAN environment. You'd also advise applications programmers working in a TP/database environment.

You'll need at least two years' experience of IBM Assembler, A knowledge of PL1 and TP or database work would be useful. Location: Wembley. Ref. JP/0038 London

Stop Press: Top jobs in major UK software house
Here they are — some of the best software opportunities around in Birmingham and Manchester. A major UK Software house is currently on the lookout for DP staff with commercial rather than scientific backgrounds. These opportunities offer real scope and plenty of challenge with the chance to work either locally or to travel throughout the UK and overseas. Career development exists in the broadest sense — with the chance to move into other companies within the group. DP staff with the right potential could progress into management roles.

Salaries range from £3000 for Programmers to £6500 for Team Leaders. Up to £6500 for Systems Analysts and up to £7000 for Business Consultants and IMS Consultants. All this plus profit-linked bonus, generous travel and accommodation expenses and overtime pay at the rate of 40% over the normal.

The sort of people they want are: **Programmers** — with knowledge of IBM and minimum 2 years' PL1. (COBOL experience also considered.) **Senior Programmers** — 3 to 4 years' experience. **Team Leaders** — with solid experience of program specification and project scheduling. **Systems Analysts** — knowledge of IBM file organisation and 3 years' analysis experience. **Business Consultants** — minimum 5 years' analysis experience. **IBM knowledge and the ability to communicate with DP and non-DP people.** Expert knowledge in specific area essential. **IMS Consultants** — with in-depth knowledge of IMS from a database communications or database design viewpoint.

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Knight Computer Services Limited, 14 Old Park Lane, London W1Y 4NL
Midlands Recruitment Limited, Woodlands Road, Birmingham B83 8DQ

Knight Computer Services Limited
Staff Services Division of BCC Database Group and a member of Computing Services Association

Sponsored by Computer Weekly Data Processing

COMPEC EUROPE '78

CENTRE INTERNATIONAL ROGIER, BRUSSELS

May 9, 10 and 11, 1978

The third annual specialised exhibition devoted solely and exclusively to small computers, computer peripherals and systems to be staged in Brussels.

COMPEC EUROPE in 1977 drew 5,300 visitors from the cream of the computer world. They came from as far away as the USA, Russia, Japan, Finland, Italy, Hungary and Poland — as well as from the great industrial areas of Germany, Holland, Belgium, France and the United Kingdom.

COMPEC EUROPE is sponsored by the leading United Kingdom publications, "Computer Weekly" and "Data Processing", and is organised for them by Bill Promotions. All are members of IPC Business Press at Dorset House, Stamford Street, London, SE1 9LU, England. Telephone: 01-261 8000. Telex: 26137 BISPRS G

To: Chris Timmins, Exhibition Manager, Compec Europe, Room 821, Dorset House, Stamford Street, London, SE1 9LU, England.

Name
Street and Number
Town
District and Postcode
Country

* I wish to exhibit at COMPEC EUROPE '78 — please send me details.

* I wish to visit COMPEC EUROPE '78 — please send me (number) free pre-registration tickets.

* Complete and return to applicable

JBA

IRAN

Honeywell 6000/60 Level 66 Personnel
Net Minimum \$30,000 + Expenses

Our client is seeking the following categories of personnel: system software programmers and analysts, applications programmers, operations managers, and GCOS specialists. Applicants should have at least 18 months to 2 years solid experience working with appropriate Honeywell equipment and be fully familiar with techniques and functional aspects. Additional experience of terminals and line discipline would be an advantage. *First class opportunity to enjoy a phenomenally well paid assignment in one of the more pleasant areas of the Middle East.*

Contact Mike Creamer

Programmers and Analysts

London up to £8,750
 A large and well established organisation, installing an ICL 2900 which will include real-time and database applications, has vacancies for programmers and analysts at most levels to work on the development of the system.

Programmers must have two years experience of PLAN or COBOL (or both) and Senior Programmers would be expected to have a wider background in both software and applications. Knowledge of GII or VME would be a positive advantage.

Systems staff should have a programming background which has been followed by several years in the design and implementation of real-time/database applications.

Training in ICL 2900 will be given where required.

Salaries according to experience. Challenging environment.

Contact Jim Baker

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES
International Personnel Consultants
 16 Maddox Street, London W.1. Tel: 01-491 4478

Team Leader Word Processing

Central London to £8,000
 This is an excellent opportunity for a highly motivated d.p. specialist to work for a well-known and successful consultancy on the design and implementation of a sophisticated Word Processing System. The client is particularly keen to meet someone with around 3/4 years experience of working with Assembler Software, including the specification and building of systems. Essential attributes will be creative thinking, up to date knowledge of mini computers and software developments and the ability to control a team of professional staff.

First class product, generous salary and superb prospects.

Contact Margaret Stevens

Minicomputer Programmers

Home Counties up to £6,000
 Our client, a leading Systems House in this country, has requirements for programmers to work on the development of sophisticated real-time applications.

Candidates must have at least one year's experience for junior positions and several years for the more senior vacancies. A background of minis/micros using Assembler, CORAL, FORTRAN is ideal. Knowledge of software such as linkers, loaders, cross assembler would be an extra advantage.

These are excellent opportunities to work in a professional environment. Salaries negotiable according to experience.

Contact Jim Baker

Programmer Analyst

West of London - U.S.A. up to £8000

This manufacturer of technical micro-based business systems seeks a presentable and qualified person with M/CODE and ASSEMBLER experience and a background of micro-processor (or mini) based systems, together with recent involvement of both terminal hardware and communications software. Work involves a lot of customer liaison, occasional visits to the U.S.A. and possibly, later, world travel.

Relocation assistance and excellent salary for the right person.

Contact Mike Creamer

MANAGEMENT & EXECUTIVE SELECTION

COMPUTER WEEKLY, November 17, 1977

telephone 01-637 9611

SNR CONSULTANT

£6½-7½k +

BUCKS

Five years ago this software house set up with the prime objective of creating a business based on quality of work. Without doubt they have succeeded. The result has been a substantial growth and diversification, most recently in the rise of the mini computer system division. They concentrate on commercial and T/P systems run mostly on DEC, Data General and Hewlett Packard machines. It is into this section that they wish to recruit a senior consultant. The work will involve both pre-sales hardware and software evaluation, analysis, design, costing, proposals, writing and demonstrations, as well as post-sale implementation and maintenance. Previous project management experience on commercial or T/P mini systems is essential. The highest standards of personal presentation and work output are necessary to maintain their reputation for good customer relations. But all this is well rewarded, for the company knows that its success depends on its people, and does everything in its power to keep them happy.

Contact Pam Quinlan

PROGRAM TRAINING

£6-6½K

CENTRAL LONDON

This is your chance to break out of programming and to become actively involved in training. Our client, a multi-million international oil company, require someone to set up and give a new training schedule. What they require is not an experienced lecturer, but a top flight structured COBOL programmer, to pass on his valuable experience to the in house programmers and to set up standards in training techniques, implementation documentation. The rewards for the job are those expected of such a prosperous company.

Contact Pam Quinlan

PROGRAMMERS to £5,200

CENTRAL LONDON

COBOL programmers with at least 18 months' experience, preferably on IBM equipment, are required by our client, one of the largest bureaux in the country. This well established company has been increasing the size of its existing business and range of products despite the recent recession and now requires experienced people to assist with development and enhancement. Structured programming techniques are being used and training will be given where necessary.

The company also offers many fringe benefits and excellent career prospects.

Contact Rowland Middleton

PRODUCTION ENGR.

to £5½K

SUSSEX

Join an expanding mini and micro computer manufacturer. The successful applicant will work under the direction of the Production Engineering Manager in the planning and direction of production engineering activities with regard to new and existing products.

Responsibilities will include the release of all new products into the manufacturing department; the continuous monitoring of existing products for improvements in design, cost and manufacturing methods; the setting up and control of the use of standard components and parts within the company's products and the establishment of an advisory and technical support service to the manufacturing unit.

Applicants should be a minimum of 25 years of age, hold an HNC in electronics and have five years' experience as a production engineer in a company manufacturing electro mechanical devices.

Relocation expenses will be made available where necessary.

Contact Peter Gorton

★★★★★★★★★★★★★★

★★ SPECIAL NEWS FOR PROGRAMMERS IN NORTH-WEST LONDON ★★

WE ARE COMING YOUR WAY SOON
WATCH THIS SPACE NEXT WEEK FOR DETAILS

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT &
 EXECUTIVE SELECTION

TECH. SUPPORT Neg c£5K

NORTH LONDON based

Our client, an international mini-computer manufacturer, requires 2 people to assist with their expanding business in the North London area. You will be required to work closely with an end user, developing and tailoring systems to his own requirements. You would then handle implementation and maintenance with that customer until such time as the systems are working satisfactorily. The time spent with each customer would be no more than 1 year, unless there were further systems to be developed, and as the customers are in either banking, finance or leasing the growth is currently within the Greater London area.

Requirements for these positions are a minimum of two years' low-level programming and an ability to communicate at all levels. Applicants must also be able to work on their own initiative and become involved with all aspects of a customer's system.

Both positions offer a wide variety of work and good career prospects within an expanding company.

Contact Rowland Middleton

DATABASE ANALYST £6½K

CENTRAL LONDON

In order to qualify for this attractive job it is essential that you have had at least one year designing systems in IMS database, and previous to that a substantial programming background, preferably in DL/1.

In 1978 our client, a major oil company, plans to implement vast communications and database systems, and if you are suitably qualified require you to develop and implement the database. This is the right industry to move into if a successful and lucrative career is your goal.

Contact Rowland Middleton

ANAL/PROG CRAWLEY

£5K

This is a marvellous opportunity to develop your career away from the mad rush of town. Our client requires an Analyst/Programmer with experience of ICL 1900 or 2903/4 to design and develop commercial systems.

The successful candidate will have a minimum of two years' systems experience, having been involved in the design and implementation of at least one major system. He/she should also show the necessary maturity to progress to a management position.

Both the working environment and the benefits are truly excellent, including a mortgage subsidy scheme.

Contact Gareth Bennett-Coles

INTERNATIONAL SUPPORT

U.K. BASED £7K + C/A

The international division of this highly successful mini computer manufacturer has attained outstanding results in its drive into Europe, the Middle East and Africa.

As a result of their expansion they are looking for an experienced Support Executive to join their lively team. He or she will be responsible for technical support in a group of allocated countries providing liaison and high level support from the U.K. Headquarters to the local support groups. Overseas travel on short term assignments will therefore be involved. The executive will provide all pre- and post-sales support including: Handling large projects, formulating proposals, running benchmarks and giving technical presentations on software products. The successful candidate will have at least 5 years' DP experience on Mainframe and/or mini computers and at least 2 years' support experience of the commercial and/or scientific markets. FORTRAN, COBOL and Assembler knowledge would be ideal.

Contact Peter Gorton

Duncan Bransom Recruitment

PROGRAMMERS
up to £5,500

A major development programme at UNILEVER COMPUTER SERVICES LTD. (UCSL) means that they need the services of two experienced programmers - one to work on mainly PLI projects and the other for Cobol.

The systems will be developed to operate on IBM and ITEL mainframe computers through terminals or non-IBM minis front-ending to them.

Applicants should have had at least two years' programming experience preferably under OS.

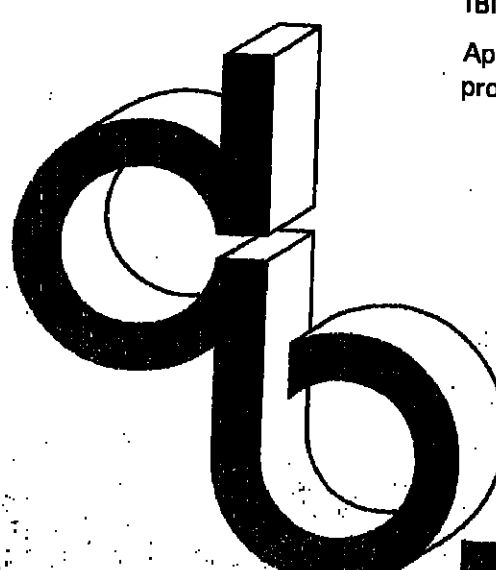
The company's staff development scheme will ensure that those with the necessary ability and energy will be able to make progress either into new fields of specialisation or into the management of the company.

If you would like to be considered for one of these jobs or would simply like to talk about them, Roger Griffiths of Duncan Bransom Ltd. will be at UCSL's Head Office at Station House, Harrow Road, Wembley, Middlesex - telephone 01-903 1414. Why not drop in to see him or telephone him there any time from Monday to Friday, 21st - 25th November, inclusive, between the hours of 8.00 am and 7.00 pm. Interviews can be arranged while you wait.

After the 25th November, please contact him at the Duncan Bransom office at 37 Hillcrest Road, Loughton, Essex. Telephone 01-508 5121.

Please write or telephone for an application form to:
 Roger Griffiths, Duncan Bransom Ltd.,
 37, Hillcrest Road, Loughton, Essex
 Telephone 01-808 6121

Duncan Bransom Limited



In Hemel Hempstead Hurricanes hardly happen!

Yet the speed of our development might make you think otherwise. In seven years we've grown from nothing to the World's largest independent supplier of Remote Batch Terminal and distributed Data Processing equipment, and we want to keep up with this whirlwind pace.

By April next year we plan to take on twenty more programmers for our Software Development Group, working on the design, planning, implementation and product testing of a wide range of advanced products. These projects cover the field of data entry, stand alone processing, batch communications, remote file management and on-line file management, and provide a rare opportunity for the ambitious programmer.

Salaries? Depending on your background, between £4,000 and £6,000 p.a.

DATA 100

If you would like to find out more, why not fill in the coupon. Or for an appointment, telephone Hemel Hempstead 66526 and speak to: Mike Griffin.

COUPON REPLY TO:
Mike Griffin, Data 100 Limited,
Maxted Close, Hemel Hempstead,
Herts. HP2 7LD.

Please send me an application form and further details.

Name.....

Address.....

Post Code.....

TEAM LEADER MATERIAL? LET'S TALK DISTRIBUTED PROCESSING IN LONDON SALARIES £5,500 p.a.

This multi-million turnover Company uses its large IBM installation primarily to provide a comprehensive internal computing service. The central London computer unit is embarking upon an ambitious DISTRIBUTED SYSTEMS DEVELOPMENT PLAN, which has meant significant team expansion.

Two key areas present themselves:—

PROGRAMMING TEAM LEADER

- ★ a minimum of 3 years' programming experience
- ★ fluency in COBOL
- ★ supervisory experience
- ★ some experience of program design

SENIOR PROGRAMMERS

- ★ 2 years' + programming experience
- ★ fluency in COBOL
- ★ ability to progress in supervisory roles

You should have gained a sound commercial understanding, preferably in an IBM environment. Career progression is excellent, so too are the working conditions. Attractive fringe benefits include season ticket loan scheme and concessionary discounts on Company products.

CONTACT: DAVE SCARLETT on: 01-935 0671

SPECIALIST COMPUTER RECRUITMENT LTD.
BIRMINGHAM 021-236 3781 FREEPOST
Freepost, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B3 2BR
MANCHESTER 061-833 0676 FREEPOST
Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD
LONDON 01-935 0671 FREEPOST
Freepost 6, 102, Blandford Street, London W1E 1JZ

REF: CW/11/16

SCA Computing Services Association

Duncan Bransom Recruitment

SYSTEMS ANALYSTS PROJECT MANAGERS XYZ PEOPLE

*What's in
a name?!*

Starting salaries from £5,500 to £7,500

The Company

At UNILEVER COMPUTER SERVICES LTD. (UCSL), part of Unilever, one of the world's giant corporations, each individual is helped and encouraged in the development of his professional career.

Career Development

After an initial period for adjustment to your new surroundings, you will begin assignments that will progressively stretch you. You will be encouraged to accept greater responsibility and to seek promotion through the various grades. Training and guidance will be given at each such change, the objective being to help you make progress while the Company gets the benefit of your ever-increasing expertise. Promotion to management posts within the company follow the same pattern, and your rate of progress will depend only on your own ability.

Other opportunities for the development of your professional career could include a transfer to one of the other UCSL divisions e.g. Micronics, Time-sharing, etc. Alternatively there are career possibilities for those who may wish to move to other parts of the Unilever Group itself.

The Work

The work consists of analysing designing and installing systems. Clients may be within the Unilever group of companies or completely outside it. Projects vary in length from two months to two years. It will be your responsibility to see a project through from start to finish. When that is finished then there will be another one behind and another one behind that and so on You will also be expected to look after your client and make sure that he is satisfied with the service provided — a role not unlike that of the data processing manager himself.

Systems are run on UCSL's IBM and ITEL mainframes through terminals or minis front ending to them.

How much experience is necessary?

With about two years' programming followed by two years' significant systems experience, you could find yourself taking charge of projects straight away. With more experience you would handle bigger or multiple projects.

Has it got to be I.B.M.?

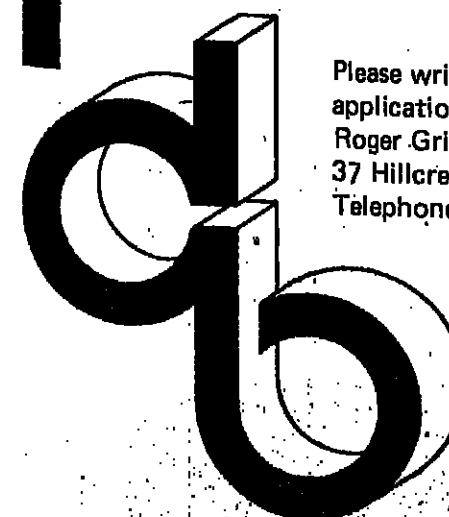
Your previous experience does not necessarily have to be on IBM equipment but those applicants with significant IBM experience will be able to fit into the working environment more quickly. This will obviously give them an edge over those who have not.

Further Information, Application Forms, Interviews

If you would like to be considered for one of these jobs or would simply like to talk about them, Roger Griffiths of Duncan Bransom Ltd. will be at UCSL's Head Office at Station House, Harrow Road, Wembley, Middlesex — Telephone 01-903 1414. Why not drop in to see him or telephone him there any time from Monday to Friday, 21st — 25th November, inclusive between the hours of 8.00 am and 7.00 pm. Interviews can be arranged while you wait.

After the 25th November, please contact him at the Duncan Bransom office at 37 Hillcrest Road, Loughton, Essex. Telephone 01-608 5121.

Please write or telephone for an application form to:
Roger Griffiths, Duncan Bransom Ltd.
37 Hillcrest Road, Loughton, Essex.
Telephone: 01-608 5121



Duncan Bransom Limited

01-608 5121

Business development in the Middle East

لوجيكا

Logica, one of Europe's leading computer services companies, is continuing to expand its activities in the Middle East. We are currently working on major projects in Iraq, Libya, Saudi Arabia and Kuwait.

We are looking for a senior person to head up Logica's marketing and sales in the Middle East. This is a new post within Logica's recently established Middle East Operation and offers exciting opportunities for someone who wants to get in on the ground floor. The right person should have a successful record in sales and marketing preferably in the computer services field, and must have proven experience of international business development ideally in the Middle East. A good technical background and the ability to communicate at all levels on Logica's range of services especially in the areas of commercial data processing and management systems is important.

The assignment will involve the development and the implementation of marketing plans, advising on bidding strategies, preparation and negotiations of contracts and assisting and advising our technical staff in the preparation of proposals.

The post is based in London with extensive travel to the Middle East. Knowledge of Arabic would be an advantage. There is a very good salary with fringe benefits including Life Assurance and Pension Scheme.

If you want a challenging job and are capable of working with highly professional computer people call Kathleen Scott on 01-637 9111 or write, using Freepost and quoting reference ME0/1 to:

logica Freepost
64 Newman Street
London W1A 4SE

Retail Business Consultants

Join our rapid growth in Point of Sale computer systems

International Computers

think computers - think ICL

ICL

ICL are totally committed to Point of Sale retail systems, and are well on the way to becoming market leaders.

You will be involved in our development of new and existing products that will take us far ahead of our competitors. Our understanding of customers' retail business requirements is of prime importance, and we will expect you to have achieved proven success in the application and implementation of retail POS systems.

You will be familiar with current small business computer developments, especially distributed processing systems as applied to the retail trades. This will enable you to ensure the successful early

implementation of ICL's new POS systems for selected customers around the world. You will be based in Feltham, Middlesex, but will be working extensively in different parts of the UK and abroad.

If you have all the experience we require you can play a significant role in this exciting development, with a starting salary in excess of £6000. Relocation assistance can be given where appropriate.

For further information please contact Terry Fuller or David Atkley at Small Systems, Central S & IS, ICL, Forest Road, Feltham, Middlesex; tel. 01-890 1414 ext. 367 or 227. Please quote ref. CW1590.

MODCOMP

SOUTH OF ENGLAND
N.W./LEEDS
MIDLANDS

CUSTOMER SERVICE ENGINEERS

Modular Computer Services Inc., an American mini-computer manufacturer, has vacancies in each of the above areas. Candidates should have at least three years experience in Customer Service Engineering plus a good working knowledge of mini-computers, process control and communications systems. An excellent salary, company car and non-contributory pension and medical benefits are available for the right person.

Please write, giving brief details to:
Mrs. V. Thomson, Personnel
MODULAR COMPUTER SERVICES INC.
Export House, Woking, Surrey
Tel. Woking (04862) 71471

Expansion Brings Opportunities with Scot Meat Products in Blitchley, Bucks.

Scot Meat Products, part of the Scot Broyers Group, is recognised as being a leading European company in the cooked meat industry and is conveniently located at Blitchley in Buckinghamshire. Our computer function plays an important part in our day-to-day operations and will become more vital to us in the future. We are about to carry out a major expansion of our data processing facilities and plan to install a 2000 series computer with on-line facilities representing a significant new phase of computer development. In this context we wish to recruit the following personnel to join our team of analysts and programmers:

COMPUTER PROGRAMMER

Education to 'A' level with a minimum of 1 year's COBOL experience on ICL equipment. Salary in range £3300 to £3800.

TRAINEE/JUNIOR SYSTEMS ANALYST

Preferably a graduate, seeking a career in computing which will be demanding and challenging. The salary will depend on experience.

Successful candidates, who can be either male or female, will be involved in the development of on-line production and material control systems.

Please write giving brief career details to —
Mr. A. Gillham, Personnel Dept.
Scot Meat Products
Blitchley, Milton Keynes, Bucks.

SCOT

COOKED MEATS

SYSTEMS ANALYST Liverpool

Salary

£4000-4500

Owen Owen, the rapidly expanding department group, are looking for a Systems Analyst to work on a wide range of projects using a Honeywell 64/20. You should have a successful record of 12 months systems experience, combined with the ability to communicate at all management levels.

Owen Owen offer attractive fringe benefits and the promotion prospects are excellent.

Apply to:
Mrs. C. Reid
Group Personnel Manager (Management)
Owen Owen Limited
Central Personnel Department
P.O. Box 145
109 London Road
Liverpool L69 1BD

OWEN OWEN

ANALYST/ PROGRAMMERS

£

CMG will pay you what you are worth

We pay high salaries because we expect you to shoulder a lot of responsibility.

Telephone or write for an application form, to:
Janet Gothard
CMG (West End) Ltd
Sunley House, Bedford Park
Croydon CR0 2AP
01-686 8251

COMPUTER SYSTEMS ANALYSTS

For the RAC's Head Office at Croydon

The Systems Department of the RAC requires two Analysts with experience of main frame systems development or small machine projects (Burroughs B 300 experience preferred), to join special project teams within the Department.

The RAC is a relative newcomer to Systems organisation. The Department, although still fairly small, is at present undertaking a fairly heavy work programme. This is a green field situation offering rare scope in an unusual commercial environment.

Many of the problems that will confront you will be unique to a motoring organisation. For example, one of the present tasks is to centralise and computerise a payment system involving 750,000 members.

Experience with COM would be useful. It should be emphasised that the need is not for theoreticians, but rather for two practical, down-to-earth computer people who are prepared to roll up their sleeves and tackle unusual problems realistically.

You might be a Business Analyst at present, perhaps with some exposure to a bureau environment, but anxious to become heavily involved in the challenging problems offered by a specialist organisation.

The salary offered is around £4,700. Please apply in writing, giving career details and experience, to:

Mr R. Wassberg
Systems Manager
Royal Automobile Club
RAC House
Lundowne Road
Croydon, Surrey.

RAC

COBOL COMPUTER PROGRAMMING INSTRUCTOR

£5,000 +

Why not put your programming experience to good use teaching others? Sound knowledge of COBOL programming is essential and previous experience in teaching is desirable. Make an appointment to come and see us by phoning Steve Grosse on 01-492 1841.

SENIOR SYSTEMS ANALYST SOFTWARE LECTURER

GEC Computers Limited manufacture and market the GEC 4000 Series of advanced Mini-computers which feature operating system facilities programmed into the machine hardware. **SENIOR SYSTEMS ANALYST** to join a team of analysts who provide technical support to the Sales Force. He or she will be expected to become familiar with our hardware and software products and use this knowledge to:

- respond to Customer's operational requirements
- support Sales Engineers during customer visits
- make technical presentations

Must have experience of minicomputers and peripherals, computer languages, operating systems and commercial applications. **SOFTWARE LECTURER** to augment the staff of the Computer Education Centre, which trains the Company's customers and internal staff. Candidates will have experience in computing and teaching, will build up a thorough understanding of the current and future software products marketed by the Company and be able to impart this knowledge to others. A Commercial Programming background would be useful. Competitive salaries are offered and the fringe benefits are those normally associated with a large organisation.

Please apply in writing or telephone
Mr. D. F. Wadell, Personnel Department,
GEC Computers Limited, Elstree Way,
Borehamwood, Herts.
Tel: 01-953 2030, Ext. 3697

GEC Computers Limited

88C

Sales Executive — £12,500 p.a.

On sale every eight weeks

BASIC/FOUR is probably the most successful real-time, disc based small business system in the market place world-wide, with more than 4,000 installations. Now we offer you the chance to help repeat the success in the UK. You will have all the advantages synonymous with a small company, where your contribution really counts, with all the big company benefits: Pension Scheme, BUPA, Company Car, good

basic salary plus the total back-up support from BASIC/FOUR'S international organisation. This really is an outstanding opportunity for the Sales Executive who has proved his ability to sell in this area to exploit that ability to the full.

Contact:
RICHARD MAHLER
BASIC/FOUR (UK) LTD
43 THE VALE, ACTON, W.3
01-748 0418

Computing Services Association

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Computing Services Association

To £5,600 SYSTEMS ANALYST London EC

Development of commercial data processing systems. Good experience in programming and/or hardware/software and on line systems design IBM 370 installation.

To £5,600 PROGRAMMER ANALYST Middlesbrough. Four years DP experience required, with two years COBOL programming included, for the development of general applications software.

To £5,600 ANALYST PROGRAMMER Surrey. Looking for someone who has already implemented at least one major system, our clients have a Honeywell installation. Programming is in COBOL, on line systems employ database structures.

Many more unadvertised positions
COMPUTECH SYSTEMS & PERSONNEL
168 Finchley Road, London, NW3 6HP

COMPUTECH 01-794 0202

GIBSON

Computing Services

MINI MICRO COMPUTERS COMMERCIAL SALES APPOINTMENTS

INCOME RELATED TO TURNOVER
£10,000/£25,000

We have been appointed O.E.M.s for possibly the most commercial manufacturer/supplier of Real-time Mini & Micro computer systems in the UK. These appointments are for sales personnel with a proven record of selling experience in some of the following:

Mini Computers
Bureau sales
V.R.C.

Micro Computers
Mainframes
Terminals

Income is on a commission only basis (probably the highest in the industry) full product training will be given by the manufacturer. The company will pay further commission on achievement targets.

It is a great opportunity for a successful salesperson to be offered a partnership in the company. If you can meet this challenging appointment, write including a brief resume to:

GIBSON COMPUTING SERVICES
TRADELINE ROAD, WARRAHALL, STOCKPORT
TEL: 061-432 3515

A career move & a better life in the West of Ireland

Digital Equipment International Ltd. in Galway is a subsidiary of the world's largest mini-computer manufacturer. We employ in excess of 38,000 people world wide with over 1,000 at our principal manufacturing plant for Europe at Galway, in the West of Ireland.

The success of DEC products has led to a continued expansion so we now need to develop our EDP section. We are currently looking for a Project Manager and experienced Programmer Analysts to add to our team of over 30 EDP professionals who operate one of the most powerful data processing installations in Ireland. This consists of a large time sharing DEC System 10 mainframe as well as PDP11 minis, providing on-line facilities to over 60 in-plant terminals and to our other European manufacturing plants.

We are also part of Digital's Data Communications Network which currently stretches from Geneva in Switzerland to the West Coast of the USA. The system is used for a wide range of sophisticated applications covering manufacturing, material control, purchasing, order processing, financial and administrative areas.

PROJECT MANAGER

This is a challenging role offering real responsibility and high rewards for an ambitious DP professional. You should be experienced in the implementation of at least one large system in COBOL and preferably have some supervisory experience.

PROGRAMMER ANALYSTS

You will be involved in updating existing systems, presenting to management and implementing new systems. You should have at least 2 years' experience in systems and programming using COBOL on any machine.

Salaries for the positions are very attractive and conditions of employment are those to be expected from a major progressive company and include full relocation expenses. If you are interested in any of the above positions, then telephone or write for an application form to: Pete Cooney, Recruitment Manager.

P.S.

Our expansion means that we have an ongoing need for experienced DP professionals. We expect to have a number of openings during the next 6 months so if you would like to share in our success then contact us now!

digital

DIGITAL EQUIPMENT INTERNATIONAL

Industrial Estate, Ballybrit, Galway,
Tel: Galway (091) 7651

If you like the sound of us.

We started in computer services 5 years ago, just four of us. Now we're 15 times bigger, still growing, working throughout the UK and Europe - consultancy, turnkey systems, software, contract services.

Our increased size hasn't made us less human. People like working here. Maybe because we give every opinion a chance, try always to do a good job better, and we pay well for those who think the same way.

And this sounds like you.**Systems analysts.** (We need 3.)

Your background includes planning and implementing commercial systems, preferably using TP and/or Database disciplines.

Analyst/Programmers. (We need 2.)

You have thorough knowledge of IBM 370, preferably in an Assembler or PLI environment.

Programmers. (We need 4.)

You're experienced in two of these four languages: Assembler, COBOL, RPG, PLI.

If you're right for us, we'll top whatever you're earning now. If you want to be with an energetic company that can only go ahead -

Get in touch.

Hill Price Davison Ltd, Walham House,
Walham Grove, London SW6 1QP 01-381 3266.

GRADUATES!

Here is the opportunity you have been waiting for

GRADUATE/TRAINEE PROGRAMMERS

SALARY CIRCA £3,000

Our client, based in the West Midlands, is a well-established, multi-million pound company, who are utilising latest computing techniques.

They offer successful candidates the opportunity of gaining sound commercial experience within a friendly, professional environment, assisting in the development of several major new projects within the Computer Services Department.

Applicants should have a minimum of two 'A' Levels, but preferably have an HND or relevant computing qualification and possess a good personal manner and presence. The company offer excellent benefits including pension and life assurance schemes, subsidised lunches, sports and social facilities, etc.

Contribution towards relocation expenses is available where appropriate, therefore make a move in the right direction and contact:-

ROD BEESON

On 021-236 3781

Ref CW/11/17

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J. A. Taylor, Resources Manager,
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Candidates must have, or obtain in 1978, a degree, HNC or equivalent qualification in Mathematics, Computer Science, Physics or another appropriate discipline.

Appointment will normally be as Scientific Officer (£2690-£4030) or Higher Scientific Officer (£3740-£4975), exceptionally as Senior Scientific Officer (£4700-£6300), depending on age, qualifications and experience. Starting salary may be above the minimum at each level. There are promotion prospects and a non-contributory pension scheme.

For further details and application form (to be returned by 19 December 1977) contact Miss E. M. Piper CM(S)163, Ministry of Defence, Savoy Hill House, Savoy Hill, London WC2R 0BX. Please quote ref: SA/37/F.

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The success in U.K. of Honeywell Information Systems Ltd. Distributed Systems Environment programme has created an additional vacancy for a Network Planning Consultant in our Technical Strategic Planning Department of our Customer Services Division.

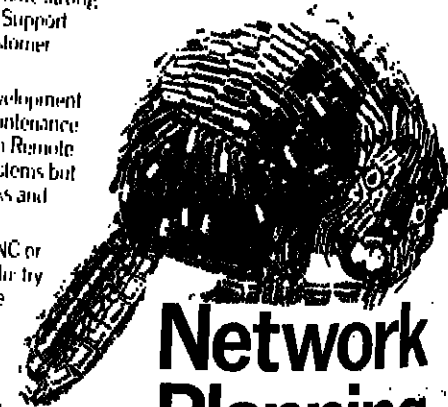
The Technical Strategic Planning Department work very closely with other departments at international level with Honeywell. We have strong influence on the Maintenance and Support Strategies and policies of the Customer Services Division.

The Duties will involve: Research, Development and Implementation of Advanced Maintenance Techniques with special emphasis on Remote Fault Diagnosis of all types of D.P. Systems but with special emphasis on Networks and Distributed Systems.

Ideally you should possess ONC, HNC or equivalent and have 5 years in D.P. industry preferably with a Major Main Frame Manufacturer with at least 2 years involvement in Data Communications.

An excellent salary will be paid together with an attractive range of fringe benefits.

Please telephone or write to Mrs Janet Field, Personnel Department, Honeywell Information Systems, Great West Road, Brentford, Middlesex. Telephone 01 838 9191



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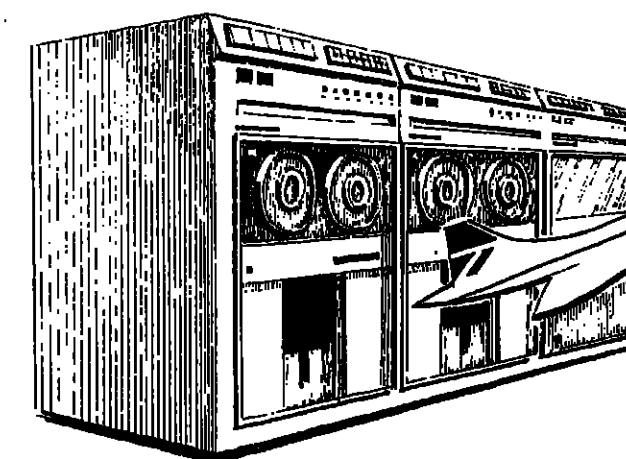
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NEW SYSTEMS DEVELOPMENT

Management Services have been given Board approval to start work on what must be one of the most interesting computer systems developments currently planned in the UK. The project will involve automating a large proportion of the clerical activities involved in selling travel. A network of P.O.S. terminals and other computer equipment will be installed linked to the Peterborough computer centre and to third party reservations systems - operated for example - by airlines. The scheme is part of a long term development plan, in which experimental work during 1978 will lead to a major implementation programme for 1979 into the 1980s.

OPPORTUNITIES

We need high flying systems and computer people with experience in one or more of these areas.

Specifically we need:

SENIOR ANALYSTS

- * About 3 years' good relevant experience.
- * Successful implementation of at least one major system.
- * Management potential.
- * Relevant applications.

ANALYSTS

- * About 2 years' experience.
- * Sound general education and systems training
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PROGRAMMING TEAM LEADERS

- * Proven leadership ability.
- * Sound relevant technical experience.

SENIOR PROGRAMMERS/ PROGRAMMERS

- * 2 years' experience in computing.
- * Experience with minis or real-time systems.

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S.C.R. is retained by Thomas Cook Group Ltd., specifically to recruit for the above positions. All applicants should apply directly to S.C.R. who are conducting the initial interviews.

CONTACT REG HEATH

021-236 3781

REF. NO. CW/11/13

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CA Computing
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Office 154

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Plus benefits worth up to
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This is a chance to broaden your experience in an installation comprising three large IBM machines running on-line and batch systems using DOS/GRASP and CICS. New equipment and software to be installed next year means good promotion prospects for the people who join now.

Our client offers a defined career path within the operations area, external and on the job training as appropriate and a valuable package of fringe benefits which includes low interest mortgage scheme, free BUPA, free life insurance, non-contributory pension and many others which mean day-to-day cash in the pocket.

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Applicants should be less than 30 years old and should have accepted 3 shift working, 5 days a week, as a way of life.

For the senior positions you must be technically sound not only on IBM 360 or 370 hardware but on the associated software, utilities and JCL. Deputy shift leaders will organise the work off our other people on each shift whilst the senior operators will take responsibility for the work on their particular machines.

For the junior positions you must have at least one year's experience as an operator although not necessarily on IBM equipment as our client will carry out any conversion training required.

To apply for any of these positions please telephone or send your cv to



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- * management of advertising budget
- * production of trade shows
- * press releases
- * technical publications
- * financial announcements

Additionally, he must be capable of "growing" a full P.R. Department and, ideally, should be fluent in a European tongue in addition to English. Some travel to the USA is an additional feature of this exciting appointment.

CONTACT: DALE HADLEY on: 021-236 3781

REF: CW/11/10

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Applicants should have at least 4-5 years' programming experience in both COBOL and ASSEMBLER and preferably already have worked on the analysis and design of a major commercial application. ON-LINE programming experience is essential and a knowledge of any database management system would be a distinct advantage. We are also looking for proven ability in staff supervision.

The company is located in the north-east of Derby within easy reach of the Derbyshire peaks and all re-location expenses will be met.

Apply in the first instance to: Personnel Officer, William Hallins & Co. Limited, Viyella House, Somercotes, Derbyshire.

VIYELLA

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Apply in writing, enclosing a curriculum vitae, including current location and salary, quoting reference number SC/102/80 to the Personnel Officer, PO Box 86, Manchester, M20 1QD by 2nd December, 1977.

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Our clients offer a wide range of services with excellent technical support. The terms and conditions of employment which apply to these positions are commensurate with a Company of the stature of UNILEVER.

S.C.R. is retained by Unilever to recruit for the above positions. All applicants should apply directly to S.C.R., who are conducting the initial interviews.

CONTACT: DAVID WADE on: 081-833 0676 REF: CW/11/20

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Materials Analyst Bahrain

The Bahrain Petroleum Company Limited requires a Stores Materials Analyst for their Refinery in Bahrain. Candidates should possess training and experience in Systems and Methods, and have had industrial experience in Materials control and planning, preferably in the oil refining or petrochemicals industries. This should include experience in computerised stock control systems and allied accounting functions, especially related to stock holding costs and ordering frequency. The successful candidate will be expected to contribute immediately to a review of existing systems with a view to improvements in line with the Company's latest requirements. Membership of Institute of Purchasing and Supply would be an advantage and candidates should be at least 30 years old to have the requisite experience for this position.

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Please send details of age, qualifications and experience, requesting an application form to:-

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Quoting Ref: MAB/CW

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with at least 'A' level education and a minimum of 3 years' PL/1, 360/370 with JCL, and IMS programming experience supported by a further qualification or membership of B.C.S.

Technical Systems Programmers

with 360/370 experience and knowledge of the internals of the OS/VS systems programme and also MVS internals, generation, de-bugging and maintenance. An engineering or computer science degree would be helpful.

The EDP operation centres on dual 370/158 and 370/168 under MVS and existing applications include materials control, maintenance scheduling, finance, payroll, tax and benefits plans. A large scale IMS/VS personnel data base is also being developed.

Appointments are single-status based on the Special Work Schedule; housing is air-conditioned and recreational facilities are excellent. A full, valid UK driving licence is essential.

Please send a brief description of qualifications and experience, quoting the appropriate reference, to Richard Darvell, Astral Recruitment Associates, Astral House, 17-19 Maddox Street, London, W1R 0EY.

Search, Selection, Recruitment Advertising

**SHEFFIELD CITY POLYTECHNIC**
COMPUTER SERVICES**LECTURER**

for Staff User Education and Liaison

The successful candidate will be responsible to the Application Manager for the provision of short courses and seminars to assist Polytechnic staff in developing their use of the central computer service. The successful candidate will also be required to liaise with staff to encourage and assist them in the production of program materials to be used in teaching.

The service is based on an IBM 370/138 computer which provides batch and timesharing services to the Polytechnic, local colleges and schools.

Applicants should have sound practical computing experience and demonstrate an understanding of computing as it relates to a wide range of disciplines.

The successful candidate will be appointed at an appropriate point on the Senior Lecturer or Lecturer II scale depending on experience.

Salary Scale: Senior Lecturer (£6223-£8447 (p.a.)) — £6808, Lecturer II (£3744-£6085)

Requests for an application form, in writing only please, to the Personnel Officer, Sheffield City Polytechnic, Hallford House, Fitzalan Square, Sheffield, S1 2BB, to whom completed forms should be returned by December 2, 1977. Please quote ref. CW.

LONDON SCHOOL OF ECONOMICS**SYSTEMS PROGRAMMER**

A systems programme is required to participate in the development of an advanced multi-tasking timesharing system. The computer is a Modcomp IV, a powerful 32-bit machine with a number of unusual hardware features.

The successful applicants will be involved as part of a small team, in many aspects of operating system design and implementation, offering considerable scope for creative work. Applicants should be educated to degree level and at least two years' proven practical experience in assembly language or essential systems programming in multi-tasking environments would be of particular value.

Salary, including London Allowance, is in the range £3,377-£5,048 (baffinity) but may be £5,281 (scale currently under review) and excellent conditions of service are offered.

Application forms from The Assistant Personnel Officer (C20), London School of Economics, Houghton Street, London WC2A 2AE, (Tel. 01-405 7888, Ext. 672) should be submitted by 8 December, 1977.

HERTFORDSHIRE PROJECT LEADER OPPORTUNITIES BRITISH MINI COMPUTER MANUFACTURER circa £6,000

For Senior Programmers with the ability to manage small Design Teams, this represents an exceptional opportunity for career progression.

Our Client's highly successful range of computer systems have earned them increasing acceptance in both the technical and commercial markets.

Volume of sales has created requirements for additional software expertise in the following areas:

PRODUCT SOFTWARE DEVELOPMENT

Product developments include:

- * operating systems software and languages
- * telecommunications and transaction processing software, including the use of micro-processors

Your responsibilities would require, in any of the above areas:

- * the creative flair in software understanding and development

Both of the above positions offer early management opportunities of larger teams as the Company continues its market penetration.

CONTACT: DAVE SCARLETT on: 01-935 0671

SPECIAL CUSTOMER APPLICATIONS

This Team provides tailored software solutions ranging from enhancements of software packages to major turn-key systems.

Skills demanded include:

- * the creative ability expected in a software development team
- * the personal skills to succeed in communicating with customers in pre- and post-sales situations
- * a sound hardware know-how

SPECIALIST COMPUTER RECRUITMENT LTD.

BIRMINGHAM 021-236 3781 FREEPOST

Freeport, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B3 2BR

MANCHESTER 061-833 0676 FREEPOST

Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST 6

Freeport 6, 102, Blandford Street, London W1E 1JZ



SOFTWARE DESIGN AND DEVELOPMENT

The use of mini-computers and microprocessors is spreading rapidly, generating exciting career opportunities for software people. One of the fastest growing application areas is in the real-time control of complex automated systems for various industrial processes.

Our client is a British company, long established internationally in the forefront of its chosen field. Their organisation embodies a Software Design Department, which undertakes the design and development of standard systems software, language facilities and compilers, as well as advanced application packages. These are used by application groups to build custom automation systems.

Increasing new product development and business expansion have generated interesting career vacancies.

Located in very congenial conditions in the Northern Home Counties, these vacancies represent an excellent opportunity for career development in one of the most exciting and fast developing sectors of computing today.

Terms of employment include an excellent Superannuation Scheme, 4 weeks' holiday, free life assurance, subsidised restaurant and sports/social facilities. Where applicable, relocation assistance is available.

TEAM LEADER - CORAL

£NEG

A Senior Software Designer, with 5/6 years' mini-midl experience mainly on compiler development (especially Coral, Fortran, Algol, Pascal, RTL2), is required to lead a team responsible for the continuing development of a CORAL compiler, including the design of major enhancements and the design and implementation of supporting software.

RW44/1

TEAM LEADER - Interactive Languages & Support

£NEG

Responsible for the detailed design of interactive language systems, assemblers, linkers, etc., this Team Leader will probably have 4 years' experience on "systems" software, including interactive languages. He/she will currently be functioning as a team leader and will also have knowledge of compilers or real-time operating systems, or other relevant areas.

These are primarily technical roles, but team leading ability is also essential.

SENIOR SOFTWARE DESIGNER - CORAL

Up to £7500 p.a.

Reporting to the Team Leader — CORAL, the Senior Software Designer will be responsible for detailed design and implementation of sections of the CORAL compiler.

Candidates will have some 3 years' relevant experience, of which some 50% should have been on minis.

RW 44/3

SOFTWARE DESIGNER

Up to £5500 p.a.

A man or woman with two or more years' experience is required to work in the real-time operating systems area, or perhaps detailed level compiler work.

The important qualifications for this job are application and the ability to display a creative flair to software development work. Knowledge of operating systems or compilers would be advantageous, but evidence of creativity and mental capability is more important.

RW 44/4

SOFTWARE DESIGNERS - APPLICATIONS AND SYSTEMS SOFTWARE

Up to £5500 p.a.

Possibly graded as Senior Software Designers, these men/women will join a team with the responsibility to add new application packages and operating systems and language facilities to the company's established product range. Candidates should have 2-4 years' experience, ideally gained in a process control environment, either as a member of a custom application group, or as part of a design group. Knowledge of at least two of the following must be evident:

Process Control
Communications
Real Time Operating Systems
Language Processors
Support Systems

RW 44/5

The above vacancies are all first-class opportunities to exercise your software skills to the full. You will be working with modern computers—Digital PDP/11 range—and utilising them in a state-of-the-art, real-time process control environment. The company's systems are in use throughout the world, controlling a wide variety of industrial processes, such as steelmaking and chemical plant, and the range of applications will undoubtedly be spread even further. The environment is thus interesting and stimulating and the work demanding and fulfilling.

The company places great store by its people, who constitute its principal asset. We would, therefore, be interested in hearing from individuals who have experience in the field and have a contribution to make, even though they need not exactly fit the above job descriptions. You are invited to telephone Tony Baker 01-499 4501 to discuss these opportunities.

hutchinson-scoggins recruitment

10 Dover Street, London W1X 3PH Telephone 01-499 4501

NEW OPERATIONS SECTION

The Anglian Water Authority is installing a dual Honeywell 66/10 384 K in its new purpose-built Computer Centre at Huntingdon.

A major programme of computer development including Data Base and Telecommunications has now started and this offers exciting opportunities for experienced staff to help set up and run a new Operations Section.

The following staff are required:-

- CHIEF OPERATOR (Ref: RP35)
Salary to £6,143
- ASSISTANT CHIEF OPERATOR (Ref: RP38)
Salary to £5,537
- NETWORK CONTROLLER (Ref: RP39)
Salary to £5,537
- ASSISTANT NETWORK CONTROLLER (Ref: RP44)
Salary to £5,000
- 2 SHIFT LEADERS (Ref: RP36)
Salary to £5,000+Shift Allowance
- 2 SENIOR OPERATORS (Ref: RP42)
Salary to £4,517+Shift Allowance
- 6 OPERATORS (Ref: RP37)
Salary to £3,673+Shift Allowance

2 Shift Working is expected to start in March 1978 for which the shift allowance will be up to 14%, depending upon shift timing.

Generous relocation expenses are payable in appropriate cases. Application forms (returnable by 5th December '77) are obtainable from the address below or by telephoning Huntingdon (0480) 56181 Ext. 252.

PERSONNEL DEPT, ANGLIAN WATER AUTHORITY, DIPLOMA HOUSE, GRAMMAR SCHOOL WALK, HUNTINGDON, CAMBS. PE18 6NZ

Small Business Computers Training Management/ Instructor Opportunities

SALES TRAINING MANAGER

Our client, a major international manufacturer launching a new small business computer, has a vacancy for a Sales Training Manager to design and develop sales training methods and conduct courses for Sales personnel, Analysts and Branch Managers. He/she will also investigate and co-ordinate training requirements internationally and follow through in the field in liaison with Branch Managers. The position calls for a dedicated person who views the training function as a key contribution to the achievement of sales budgets and profitable company growth. A background of successful selling and training in capital office equipment or small computers is required, and education to degree level would be an asset.

TECHNICAL SOFTWARE INSTRUCTOR

The Instructor will identify, develop and conduct training and educational courses which satisfy the product educational needs of both the company and customers. He or she will maintain a library of educational material and evaluate customer personnel for operator or programmer training. A working knowledge of RPGII and commercial software applications is required together with 2 years computer educational experience. Education to degree level would be an asset, and international travel will be involved. Salaries are excellent and benefits include car allowance, free life assurance, contributory pension scheme, optional BUPA membership and subsidised staff restaurant. So, either send me details of your career to date with current salary, or telephone for an application form. All replies will be treated in strict confidence and you may mention companies to which your reply should not be sent. Quote Ref CVW/200.

Brian Withers

GRS

Gerrard Recruitment Service
10 Argyll Street, London W1V 2BQ. Tel: 01-437 6816.

CUSTOMER SERVICE ENGINEERS

If you have a minimum of three years maintenance experience on large scale Univac or IBM Computer configurations which include disc and magnetic tape sub-systems we would be most interested in discussing future career prospects with you.

Successful applicants, male or female, will be offered a minimum basic salary of £6,000 per annum, in addition, generous allowances for shift work, car and relocation will be paid where appropriate.

For an interview appointment:

Phone Watford (0923) 40704
or write to:

Mr. Jim Harvey
LINK DATA SYSTEMS LTD
26 The Parade
Watford, Herts. WD1 2AA

COMPUTER MAINTENANCE SERVICES

COBOL PROGRAMMERS

We are looking for experienced COBOL programmers to work on new program development. We are based at the Society's Head Office in Bristol, where we operate an ICL 1903A computer. The next year by a New Range 2800 system. Commencing salary will be dependent upon experience. For an Application Form and further details, please write to the top of the advertised salary range a program. For an Application Form and further details, please write to the top of the advertised salary range a program. For an Application Form and further details, please write to the top of the advertised salary range a program.

CONTRACT PROGRAMMERS
RPG II VARIOUS AREAS
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(0234) 711717

COBOL PROG.
GLOUCESTERSHIRE
£4,000 p.a. + benefits
Phone 01 439 6481
(24 hours)
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CONTRACT PROGRAMMERS
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IBM 390 OS
COMPEX
(0234) 711717

Operate For A Company That Cares

And earn C. £4,300 in Croydon

If you have experience on any mainframe hardware and consider yourself a bit above the rest then we would like to meet you. Our client will provide all training necessary to enable you to carry out duties efficiently and to allow you to progress personally.

The company operates large mainframe equipment linked to a network of terminals and the management services function is expanding on a variety of fronts. You will join a team working on a 3 shift system with opportunities for overtime.

If you have the ability to act as Senior Operator, your earnings will be C.£4,300 including shift allowance with a review after six months. Other benefits include free meals with every shift.

There are wide ranging career paths within operations as well as opportunities to develop within other areas of management services. To find out more about this go-ahead installation which encourages personal progression, telephone our CROYDON office or write quoting reference: CW 65-7H.

01-888 9883 (24 HOUR ANSWERPHONE)
18 PARK STREET, CROYDON, CR9 1TN

061-236 2419 FAULKNER HOUSE
FAULKNER STREET, MANCHESTER, M1 4YD

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS

CAPP ASSOCIATES
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Computing Services Association

- ☐ LOGIC CIRCUIT DESIGN
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- ☐ CONTROL SYSTEMS
- ☐ SYSTEMS/SOFTWARE
- ☐ MINI-COMPUTERS
- ☐ TELE-COMMUNICATIONS

TWO OUT OF SIX?

If you can tick two (or more) of the boxes because you have relevant experience our client would want to talk to you. And, equally important, you would want to talk to him.

His need is for real-time systems & software engineers who are interested in working on advanced technology projects for the U.K. and export markets.

You would be interested in this field of work, are looking for a salary of between £3,500 to £5,500 p.a. now, want to join a company which can offer a variety of work and provide good working conditions in a particularly pleasant area. Further, you would like to talk to someone who won't keep you hanging about for weeks.

For a brief chat now please ring John Nolan at Richard Owen Advertising on 01-638 1891

Richard Owen Advertising
Cross Keys House, 56 Moorgate, London EC2R 6EL

NEW BIRMINGHAM SALES OPPORTUNITIES

Eurocom Data Limited

A member of the National Westminster Bank Group

SALES EXECUTIVES

SYSTEMS ANALYSTS

(To market COM in the Midlands)

CIRCA £7000 + CAR

(Basic £4000-£5000 + Commission)

Eurocom Data Ltd. is a fast growing international Computer Output on Microfilm Bureau providing services through 5 centres in the U.K. and 6 further centres in Europe via Eurocom Data (Holdings) Limited.

Suitable candidates are likely to be successful VRC or Bureau Salesmen who have a good working knowledge of Computer and Business systems, and have consistently achieved Quota. However, we would be pleased to train experienced systems/programming Persons interested in moving to a sales environment.

Applications to:-
The Personnel Manager
Eurocom Data Limited
3 High Street, Rickmansworth, Herts.
Tel. No.: Rickmansworth 74323



DEPARTMENT OF FINANCE

SERVICE AUDITOR

(COMPUTER)

Salary £4689-£5250 plus supplements

A vacancy has arisen within the Internal Audit Section for a Service Auditor (Computer) due to the post holder successfully obtaining a senior position with a Water Authority.

Responsibilities of the post will involve audit of the Authorities Computer Installation and Associated Systems. An ICL 1903T system, presently installed using the George III operating system, and extensive use is made of communications equipment.

The Director of Finance, who is also the Deputy Chief Executive of Gateshead Metropolitan Borough Council, leads a young, vigorous unit which welcomes newcomers with new ideas.

Applicants should possess a suitable accounting qualification and must have Computer Auditing experience.

For further information contact Mr. K. Robson. Tel: 0832-771204, Ext. 25.

The post is superannuable and subject to satisfactory medical clearance.

Salary and Conditions of Service are in accordance with the N.J.C. Agreement for APT and C Services.

Application forms are available from the Director of Personnel and Management Services, 7th Floor, Aldon House, Tyngate, Precinct, Sunderland Road, Gateshead, Tyne and Wear NE8 3EL, and returnable by 2nd December.

Group Leader Software

c. £6,000

Plessey Radar Research Centre at Southleigh Park House, Havant, has developed a computer based image processing system, giving a new dimension to information available to scientists concerned with environmental problems. The Remote Sensing and Image Analysis Unit is responsible for equipment development, consultancy, feasibility studies and, in part, for technique investigation both in the UK and abroad.

The Group Leader will be responsible for the software team and must have experience of the design of scientific software systems of an interactive nature. In particular experience of interfacing special purpose fast digital hardware could be an advantage.

Southleigh Park House is located in an attractive rural area of Hampshire, close to the amenities of the South Coast, between the cities of Portsmouth and Chichester.

Please contact John Best, PER, 62-64 High Street, Southampton, (0703) 38856.

PROFESSIONAL and EXECUTIVE RECRUITMENT

PLESSEY

Computer Control Systems

We are the Digital Systems Division of a large industrial corporation with business interests in all five continents. We are at present expanding our development capabilities in Welwyn Garden City to engineer a new range of equipment for automation and process control applications.

Vacancies exist for electronics design engineers and computer programmers to work on mini computer and microprocessor based projects.

Computer Programmers

One of the appointments will be at a senior level and will require both technical and leadership skills. The position will be offered to a programmer of graduate standard with several years experience including assembler language, preferably in a real time environment. Sound Fortran experience is also desirable.

Salary to £6,000 p.a.

For the other positions we are prepared to consider candidates of graduate standard and with relevant experience, but at an earlier stage in their career. Salary to £5,000 p.a.

Development Engineers

Candidates should be of degree or HNC standard with experience of digital and analog techniques. Preference will be given to applicants with experience of microprocessors or process interface equipment practice. However, suitable applicants at an early stage in their careers will be given full consideration. Salary to £5,000 p.a.

We offer a contributory pension scheme and generous assistance with relocation expenses will be given if necessary. Please write to Box 1906 Computer Weekly for application form and give brief outline of career to date.

Computer Research and Development Officer

Asda, part of the Associated Dairies Group has changed the face of retailing in the last decade. The rapid development of our retailing techniques has contributed to a turnover in excess of several hundred million pounds, and we now have 59 stores successfully operating nationwide.

Due to the continued increase in the use of computers in the control of our retail branches, it is necessary to strengthen our existing team working in our Research and Development Department at Morley, near Leeds. The successful applicant will be expected to liaise with our Group Computer Department, responsible for the design and implementation of future computer systems.

Duties will include research and specification of computer systems within the framework of the Company's computer development plan, involvement with systems testing, implementation planning

and staff training. There will also be involvement with various other projects which require the application of computer techniques.

Candidates, male or female, will need to have some practical experience of computers, programming, system specification and the application of such systems to retail distribution.

Qualifications will include a formal training with emphasis on O & M of systems control and be qualified to H.N.C. level in business studies or similar. It is also of prime importance that you have the ability to communicate at all levels of management.

The salary, which is negotiable, around £4,000, will reflect the importance of this position and assistance with re-location expenses will be given, if necessary.

Please write for an application form to:

Mr. M. R. W. Clarke,
Personnel Controller,
Asda Stores Limited,
Asda House, Britannia Road,
Morley, N. Leeds,
Yorkshire LS27 8BT



Britain's most experienced superstore operators

IBM ASSEMBLER PROGRAMMER

NORTH WEST LONDON

to £6,000

Our client is a privately owned company, responsible for the data processing function of approximately 2,000 users. They have 5 branches in and around London and 1 in Europe and we are currently recruiting for the Wembley office where their IBM hardware is located.

The successful applicant will be a member of a small team and opportunities for movement into analysis could arise. This is an excellent opportunity to get involved with development work as extensive systems redesign is planned.

You must have 2 years IBM Assembler experience, be educated to 'A' level standard and have the ability to cope with career advancement in a commercial environment.

Ref CB 4142

Computer People

FORTRAN

PROGRAMMER

to £5,000 (+ London allowance) 498

CENTRAL LONDON

An interesting and challenging job exists within a London based systems group of this leading multi-national company.

The successful applicant will have a sound knowledge of Fortran programming used in a problem solving environment, and some Technical/Mathematical experience would be advantageous. He/she will be able to use initiative and be motivated to contribute in this important systems area.

The successful applicant will have had at least 1 1/2 years relevant experience and will be encouraged to develop towards a team leading role or to progress into the broader applications areas of computer systems.

A high starting salary, four weeks holiday, first class working conditions including restaurant, sports and leisure facilities are offered with this excellent opportunity.

Generous relocation assistance is available — telephone or write to arrange an interview in London, Birmingham or Manchester.

Computer People

Ref. SC/14

SYSTEMS ANALYST

SWINDON WILTS

c £6,000 + benefits

The UK subsidiary of an International Group require a Systems Analyst for their Manufacturing Branch which is one of the most up-to-date in Europe.

Applicants should have sound applications experience, preferably from a manufacturing environment although training will be given.

A strong technical background is desired together with a good programming knowledge plus the added advantage of being able to communicate effectively with all levels of user staff.

A 370/136 is based in London and will be upgraded in February to a 370/125 model 2

A 3270 network will be installed in Swindon operating through the CICS monitor.

Working conditions and fringe benefits are excellent together with a superb career path.

Ref SIR 5000

Computer People

ESSEX

to £6,000

**Are you Bored with your work?
Are you Tired of travelling?
Are you Frustrated with lack of responsibility?**

If you are 'suffering' and have sound Cobol knowledge in either a commercial or financial environment the development projects of this U.K. organisation can provide the solution.

Ref AH 1717

Computer People

ICL/HONEYWELL OPERATIONS

£2,800 - £4,500

At present the job market is offering TREMENDOUS SCOPE for ICL and HONEYWELL operations personnel. Probably the best opportunities are for those of you with between 6 and 12 months' experience with one user and are now interested in a job move for any of the following reasons:

- to gain experience in a different installation
- increase your salary
- change shift system
- work closer to home

Why not phone us to see if your current circumstances could be improved — we would be pleased to hear from you.

Ref KS GEN.

Computer People

Computer People
A member of the Vinson Lanfield Investments group

KINGSTON SURREY

£6,000

ICL PLAN PROGRAMMER

Applicants living in South London, Surrey and Middlesex will find our client easily accessible by road and rail. In addition you will have all the advantages of working within reach of sophisticated amenities without the disadvantages of commuting into London.

Working in a bureau environment on an ICL 1901T, you will be involved in the development of new packages for a large number of clients. It is considered unlikely that applicants with less than 2 years experience of ICL 1900 PLAN would be capable of taking up the responsibilities which our client offers. However, if you are self motivated, intelligent and commercially orientated ring now to discuss this position.

Ref CB 4141

Computer People

APPLICATIONS CONSULTANT (LONDON)

PLUS CAR ALLOWANCE PLUS BONUS c. £1,000+

A total package in the region of £8,500 is available to candidates wishing to become Applications Consultants with a major computer services company.

After training, responsibilities will involve identifying and consulting on commercial applications with on going technical support in a number of high-level timesharing products with end-users, typically at senior management level.

A background including several commercial systems, preferably involving database management is required and degree level qualifications in computing or business studies is essential.

Experience in a sales environment would be an advantage.

The company can offer excellent career opportunities in its continuing expansion.

Successful candidates are likely to be between 26 and 35 with no more than two job moves in the last four years.

Ref CB 10000

Computer People

TOMORROW'S COMMUNICATIONS SYSTEMS TODAY!

SENIOR PROGRAMMER London Based up to £6,000

International Data Centres with local realtime terminal networks send the World's media men into action. PDP/11 Experience in the communications field with strong project leading potential will be of interest to our client. Knowledge of RSX 11M and RTL2 an asset.

Whilst maintaining existing systems will be an important part of the work, successful candidates will be involved in major development projects such as automatic message switching and distribution of textual news.

Could you be helping to create systems that will be tomorrow's standards?

Ref RS 6203

Computer People

PROGRAMMING CONSULTANTS

LONDON

to £6,500

An established and respected name in the consultancy field is currently recruiting for its expanding project teams. Projects usually have an emphasis on on-line or database systems, hence the opportunity to extend and advance your career.

Professional standards demand exceptional applicants, ideally with COBOL, FORTRAN or PL/1 programming experience although training will be given.

Prospects are excellent with openings into analysis and project management as a natural progression. Candidates could, on occasion, be given the opportunity to undertake foreign travel.

Ref CB 7000

Computer People

OPERATOR DOS/VS POWER

C. London

up to £4,000

Candidates must have a minimum of 12 months 370 DOS/VS experience and salaries are dependent on this. Ref NA6191

PRODUCTION CO-ORDINATOR

circa £4,000

A large International Company situated in Central London requires a production-controller/co-ordinator.

Applicants should have a sound knowledge of IBM data-control procedures coupled with related Job Control Language, operational experience would also be an asset.

The successful candidate will work on a two shift basis at a relatively senior level.

Promotional prospects are in-line with most large companies.

Ref NA 6188

Computer People



VII House 68-69 St. Martin's Lane

London WC2N 4JS

Telephone 01 240 2441

"A CHALLENGING OPPORTUNITY TO MOVE INTO SALES"

NORTHERN HOME COUNTIES AND LONDON To £8k - Car - Extensive Fringe Benefits
ARE YOU AMBITIOUS, SELF MOTIVATED AND CONFIDENT?

Our client is a well-established privately owned computer services company, which supports and sells an integrated series of products. These products enjoy acceptance in many mainframe installations, and are generally regarded as being the most complete and best supported in their particular application areas.

THE COMPANY IS GROWING DRAMATICALLY AND THE POSITION WILL APPEAL TO A SYSTEMS/ENGINEER TYPE PERSON WHO IS SEEKING A MOVE INTO A DIRECT SALES ROLE.

Candidates must have:-

- * a sound technical background from within a mainframe environment with ideally a knowledge of IBM 370 or ICL 1900 series hardware
- * if not direct sales experience within a data processing environment, then the correct personal motivation, presence and attitude to succeed in such a position.

This is an unusual opportunity to move into direct sales from a technical biased background. The company is a much enlightened employer and offers an exceptional employment package.

CANDIDATES WHO FEEL THEY WOULD ENJOY AND OPERATE EFFECTIVELY IN THIS ENVIRONMENT SHOULD CONTACT, WITHOUT DELAY:-

REG HEATH 021-236 3781 REF. NO. CW/11/19

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SCR

Computer
System
Automation

COMPUTER APPOINTMENTS

Up to £6,500 p.a.

The HODGE GROUP'S Computer Services Department wishes to appoint Systems Analysts and Programmers, with various levels of experience, to contribute towards the development of advanced new systems and techniques relating to applications within its Insurance, Credit, Banking and Insurance Divisions.

SYSTEMS ANALYSTS (Up to £6,500 p.a.)

Candidates should have a minimum of 2 years' systems experience together with a successful implementation record, preferably obtained in a financial/commercial environment. A knowledge of the ICL 1900 series would be a distinct advantage.

PROGRAMMERS (Up to £5,000 p.a.)

Candidates should have a minimum of one year's experience in an ICL 1900 series environment with communications equipment. These challenging opportunities are open to men and women. In each case we require an enthusiastic and professional approach to the job in return for a well-earned offer.

- * A very competitive salary, determined by previous experience and future potential
- * A range of comprehensive fringe benefits, including relocation expenses
- * Excellent career opportunities within a young and progressive department

Please write or telephone, in strict confidence, for an application form to:

J. A. Roberts
Manager, Recruitment and Development
THE HODGE GROUP LIMITED
Julian S. Hodge Building, Newport Road,
Cardiff CF2 1SR. Tel: Cardiff 01-2277 Ext. 215

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INSEAD

European Institute of Business Administration
Fontainebleau, France

Seek Part Time, Analyst-Programmer, with several years' Fortran Experience. Free immediately. Fluency in French, experience in Basic, Time-sharing and knowledge of DRMS desirable.

Send C.V. References and photo to:
James D. Lyons
Directeur Du Centre De Calcul
Du De Calcul
F-77305 Fontainebleau Cedex
France

Programmer / Analyst

For New ICL 2903 Installation
Starting Salary c. £4,500

The Company, which is jointly owned by ICL and Hargreaves Group Limited, has operated a growing range of commercial programs over a 7 year period on a bureau basis. Early in 1978 we are introducing our own 2903 machine. The configuration includes 28K store and 2 EDS 30 disc units. An experienced programmer/analyst is required to maintain and develop existing programs, and to extend computer use into new areas. The main requirements are:

1. At least 3 years experience in an in house commercial environment - preferably 2903 or 1900 users.
2. Substantial experience in COBOL.

If you want to grow talk to

Hargreaves

UNIVERSITY OF
ABERDEEN
COMPUTING CENTRE
**SYSTEMS
ENGINEER**

Applicants are invited for the above post. The person appointed will be responsible for supervising the maintenance and development of a large communications network including ensuring the correct installation, maintenance and repair of equipment and the person appointed should be a graduate in electrical or electronic engineering, but the most important qualification is a thorough knowledge and in-depth experience of computer engineering or communications systems. Salary on scale £3333-£6027 p.a. under review with appropriate annual increments. Further particulars from The Secretary, The University, Aberdeen, with whom applications (2 copies) should be lodged by 12th December 1977. Telephone 0224 40241, ext. 100 Aberdeen G53 3J for details.

UNIVERSITY OF EDINBURGH
Department of Linguistics
**DEPARTMENTAL
COMPUTING
OFFICER**

Applications are invited for an appointment as Departmental Computing Officer in the Phonetics Laboratory. Familiarity with the PDP-11 series of DEC computers is necessary, and an interest in speech research desirable. The successful applicant will be responsible for the operation of the Department's PDP 11/40 DEC computer, for the Departmental use of the facilities provided by the Edinburgh Regional Computing Centre, and for writing programs concerned with a wide range of research. The appointment is full time, permanent, with a salary scale of £3,333 to £6,027 p.a. at a point presently not open. Having two relatives should be sent to the Secretary, University of Edinburgh, South Bridge, Edinburgh, by 12th December 2077. Please quote Reference 2077.

**DATABASE
TECHNOLOGY
LIMITED
require
PROGRAMMERS**

with experience in Basic for Accounting System Development Top salaries paid
Contact:
Mr. M. Jones
31a High Street
Aldershot
Hampshire
Telephone:
0252 316739

New Sales Support & Sales Opportunities - UK
A major international computer manufacturer is recruiting in Europe an exciting group of small computers in the New Year. They therefore immediately require Branch Managers, Sales Analysts, Salesmen and Technical Support Personnel as well as a UK Training Office. Previous experience should be with RPGII type computers or mini computers using commercial skills and a professional approach to problem solving. Personnel will have a marvelous opportunity to get on the ground floor where salaries will be very competitive. Vacancies exist in W. LONDON, BIRMINGHAM, MANCHESTER and LEEDS. CW 46/9, Michael.

**Senior Operator
Herts. £5,000 incl.**

A major ICL user requires really good GII operators with supervisory experience. Relocation expenses are offered and there is paid overtime. CW 46/10, Patricia.

**Operators
Slough £3,700 to £4,700 incl.**

A large DOS installation with normal 3 shift working requires experienced personnel. Excellent sick pay scheme and Xmas bonus. CW 46/11, Patricia.

**Chief Operator
C. London £5,000**

This famous High Street Company requires an experienced IBM Senior Operator or Supervisor to take charge of 3 Shift Leaders and other Operators. Free lunches. Large company perks. CW 46/12, Patricia.

UCA

DATA EXPRESS HOUSE
PROSPECT PLACE
HEATHFIELD TERRACE
CHISWICK W4 3BR
Recruitment Consultants
01-995 3883 or
01-958 6138 evenings

**Programmers to
Systems Analysts
Birmingham £3,500 to £5,000**

We now have eight famous computer manufacturing companies in Birmingham looking for IBM, ICL or UNIVAC systems personnel. They offer C.P.S. profit sharing, flexible and subsidised contract with excellent career prospects. Programmers should have COBOL or PL/I experience. CW 46/14, Annette.

**Programmers
N. London £4,000 to £5,500**

Only 1 1/2 years' COBOL experience is required to work with this secure Government organisation. This ICL installation is now in New Range (2800) and then your COBOL experience will be invaluable. CW 46/14, Annette.

**Senior Programmer
Victoria £8,000**

A friendly and profitable Service Bureau using IBM computers are looking for an experienced COBOL/DOS applicant. As well as your applications to work on there are LV 11 and holidays and C.P.S. CW 46/16, Annette.

**Systems Analyst
Victoria £8,000**

An ICL oriented commercial agency requires an experienced analyst to work on their own who has programming experience. Applicants include accounts and laboratory trends and statistics. Please include BSA in 4 weeks' holidays. C.P.S. CW 46/16, Annette.

YOUNG PROGRAMMERS MOVE INTO SOFTWARE

SCOTLAND to £5,500 p.a.

Young, well educated Programmers are wanted to develop genuine machine software for one of the world's leading manufacturers. Whether you have previous software experience or just a strong desire to get into software, we want to hear from you. A sample of the software engineering posts to be filled are listed below:

OPERATING SYSTEMS

To develop the OS for one of the fastest selling mini computers in the world. No previous OS experience is necessary, just 1-2 years Assembler experience after graduating.

DATABASE

To develop database software. Must have been involved in database in some form other than applications coding, i.e. design, software coding, detailed package evaluation etc.

UTILITIES

To write stand alone utilities, i.e. directly loadable into the machine without an OS, in Assembler language. No previous experience necessary, but a degree in Computer Science preferred.

DATACOMMS

Assembler level Programmers to develop data communications software.

SYSTEMS EVALUATION

To perform quality assurance and performance measurement activities against product specifications. This will involve creating test conditions and advising on and implementing improvements in software. No previous experience necessary.

MY CLIENTS REQUIRE PEOPLE IMMEDIATELY SO CONTACT ME NOW - DAVID J. HUTCHINSON on 01-499 4501. - Ref. RW46/1

hutchinson-scoggins recruitment
10, Dover Street, London W1X 3PH
Telephone 01-499 4501

ASSEMBLER PROGRAMMER c. £5,500 p.a.

LONDON

FOR MINI SOFTWARE IMPLEMENTATION AND CUSTOMER SUPPORT IN COMMUNICATIONS.
YOUNG PERSON WITH CIRCA 3 YEARS' EXPERIENCE

The mini is one of the world's leaders. It is to be used in the form of a very intelligent terminal hooked into a complex mainframe network. Our client requires a bright young Programmer to implement the machine software as a remote batch terminal in a high speed communications environment.

After spending an initial period with the software development team, you will join the technical services division of this world famous manufacturer. In a customer support role, you will be involved in all aspects of software implementation; generation, debugging, trouble shooting, specification of enhancements and liaison with development and user staff.

If you are an Assembler level Programmer with an understanding of communications, here is your opportunity to develop further into this field. Ultimately you could move into one of a wide range of activities from software development through to sales.

RW46/2

TERMINAL CONSULTANT to £5000 LONDON

HIGH SPEED, INTELLIGENT NETWORK

As a technical consultant, you will advise and support customers on the usage of advanced intelligent synchronous terminals. The terminals will be used in a complex, high speed network environment.

You will be my clients source of understanding on all aspects of Synchronous Transmission protocols and methods. The post covers assessment of a whole range of terminals (hardware and software) and liaison with different manufacturers.

To be successful in this role demands 'A' /HND level qualifications and approximately 5 years in computing, including some sound teleprocessing experience.

Contact DAVID J. HUTCHINSON for further discussion. RW46/3.

Design....



with computers

In order to achieve the new Model Design and Development Programme for Leyland Cars, there is to be a significant expansion of the Technical Computing Department. We offer an exciting opportunity to help us meet the challenge over the next decade, working in the areas of Computer Aided Draughting, Surface Design, Structural Analysis, Simulation of Dynamic Problems, Test Data Recording and Analysis, and Systems Programming.

Applicants are likely to be aged 23-30, should be educated to Degree or HNC level in engineering, mathematics, science or computer science. FORTRAN programming experience is desirable, but not essential, as training would be considered for the right applicants.

Excellent salaries are offered and attractive fringe benefits, including a Car Purchase Scheme; 25 days holiday after one year plus 7 days statutory holiday; attractive discount on new cars after 6 months service and subsidised canteen meals. We also will pay relocation assistance where appropriate. Interested men and women should apply in writing to:-



Leyland Cars

Mr. M. D. Ray, Recruitment Co-Ordinator,
Product Engineering Division, Leyland Cars,
Solihull Plant, Lode Lane, West Midlands, B92 8NW.

DATA PROCESSING MANAGER

Wigan

c. £4,500

Foster Len Limited the furniture manufacturers are seeking a Data Processing Manager to take charge of their newly installed Philips 410 disc based system.

Packaged software is available for the sales, purchase and payroll applications but applicants, aged at least 28 years should have sufficient experience of COBOL and systems analysis to develop programmes for sales analysis and production control. Training on this new installation will be given at Philips.

There are good prospects for promotion within the group.

Contact: Mrs. Liz Davis, PER Warrington, Warrington B21 5L3.

SALES EXECUTIVES

£8K-£10K REALISTICALLY + CAR
LONDON, MANCHESTER, SCOTLAND, HOME COUNTIES

Decoll require experienced sales professionals to cover prime territories selling either mini-computer systems or terminals. Both ranges are highly competitive and offer good sales executives the opportunity to realise their earning potential.

For further details phone or write:

BOB MURRAY, UK SALES MANAGER
on 0509 66666 DURING OFFICE HOURS
or 050 684 2780 EVENINGS OR WEEKEND

FIELD SERVICE ENGINEERS

£3.5K to £5K + CAR + PROFIT SHARING
LONDON, MIDLANDS, ABERDEEN, MANCHESTER, HOME COUNTIES

To maintain our mini-computer systems and terminals, which are selling well, we require experienced customer service engineers in the above areas.

For further details phone or write:

BRIAN COLLING, MANAGING DIRECTOR
on 0509 66666

DACOLL ENGINEERING SERVICES LTD.
Decoll House, Gardens Lane, Bathgate
West Lothian

Decoll

Unique Opportunities in Image Processing

Plessey Radar Research Centre at Southleigh Park House, Havant, has developed a computer based image processing system, giving a new dimension to information available to scientists concerned with environmental problems, including inadequate world food production, increasing pollution and the limitations of the earth's natural resources.

Remote sensing by satellite and aircraft surveys using this system is a rapidly growing discipline and opportunities now exist for Electronic Engineers and Computer Scientists at various levels of responsibility. The areas include digital signal processing, man-machine interfaces and high speed computer techniques.

Additionally, Analyst/Programmers for the Software Team, with experience of nature, are required. In particular, experience of interfacing fast digital hardware could be an advantage.

Salaries will be negotiated. Principal Engineers/Analysts c. £5,000; Engineers/Analysts c. £4,000.

Southleigh Park House is located in an attractive rural area near Havant, Hampshire, close to the amenities of the South Coast.

Please contact John Best, PER, 62-64 High Street, Southampton, (0703) 39955.

PER PROFESSIONAL and EXECUTIVE RECRUITMENT

PLESSEY

Systems Analysts

London/Home Counties to £6,000+
Midlands/North of England

Our client, a major international manufacturer launching a new small business computer, has vacancies in London, the Southern Home Counties, the Midlands, and North of England. This is a ground floor opportunity for those men and women who wish to grow with one of the most prestigious names around. In particular, there are vacancies for:

Senior Systems Analysts to £6,000
Systems Analysts to £5,500
Document Writers to £4,500

The benefits package, which includes a car allowance, is excellent and the promotion prospects are real. So either send me details of your career to date, or telephone for an application form. All replies will be treated in strict confidence and you may mention companies to which your reply should be sent. Quote ref CW/202.

Brian Withers

GRS

Gerrard Recruitment Service
10, Argyll Street, London W1V 2BQ. Tel: 01-437 6816.

Scientific Programmers

Rolls-Royce & Associates Limited is engaged in an extensive programme of design, development and procurement of nuclear propulsion plant for the Royal Navy's submarines. We are looking for programmers to work on the development of systems of scientific programs using both UNIVAC 1108 digital and analogue/hybrid (SIGMA5/EA17800) computers. There are also opportunities to work on other computers including:

IBM 370
MODCOMP II
DEC PDP11
GEC 90/2
IMLAC PDS4

The most commonly used language is FORTRAN, but assembly language is used for

many of the small machine applications. Applicants, male or female, should have at least one year's experience using a high level language and knowledge of an assembly language would be an advantage. A degree in an appropriate discipline is preferred, but is not essential. A generous assistance towards relocation costs is available. Please apply in writing or by telephone for an application form to:-

The Personnel Manager
Rolls-Royce & Associates Limited
PO Box 51
Derby
DE2 8B2
or telephone Derby extension 3213

SERVICES COMBYTE LIMITED

LONDON BASED 12 PL1 PROGRAMMERS

If you have the desire to get away from the normal routine and are quite happy to spend periods in different locations throughout the U.K. and perhaps abroad then our Consultant Client would like to talk to you. As a Specialist with an excellent reputation in their field, they require better than average PL1 Programmers to undertake assignments for various Clients. Main qualifications are adaptability, mobility, capability and a liking for problem solving. SALARY reflects the type of people they are looking for and should not be a problem and will probably represent a substantial increase on your current earnings.

MID ESSEX PROGRAMMERS

If you have 2-3 years' COBOL on any MAINFRAME and are seeking a position in the Mid Essex area, we would like to hear from you. Our client is a small Manufacturing Company using a small ICL machine for a variety of Commercial Applications. SALARY is negotiable according to experience.

LONDON BANKING SPECIALIST

We have an urgent requirement from a major Banking Concern for a Senior Analyst/Programmer with extensive Banking experience. We need someone with 5 years' on either IBM or ICL machines and in-depth experience of COBOL and Systems work in Financial Applications.

In addition to a basic salary of around £5,500 p.a. the job carries a 3% mortgage plus a car plus other benefits.

LONDON ANALYST/PROGRAMMER

A City Financial Organisation has a requirement for a Programmer or Analyst Programmer to work on both REAL-TIME and Batch Systems within a small department. The current MAINFRAME is being upgraded and a mini installed in addition. You will need 4 years' use of COBOL and/or ASSEMBLER and some Systems Design ideally. The job offers an opportunity to become more involved in Systems work and carries a salary of up to £4,800 p.a. plus mortgage facilities.

SURREY RPG II PROGRAMMERS

A specialist highly successful consultancy have need for Programmers and Analyst. Programmers with at least two years' experience on IBM SYSTEM 3, SYSTEM 32 ICL 2903 or other small systems using RPG II. They are able to offer a high degree of job interest plus excellent career opportunities. SALARY is up to £6,000 p.a. PLUS a company car after an initial period.

SUFFOLK ANALYST

Located in a major East Anglian Town close to the coast and pleasant country since our client is a manufacturing company currently in the process of expanding its Data Processing activities.

They require an Analyst with 3 years' in the Design and implementation of commercial systems to act as an Internal Consultant between group users. Hardware and Programming background is not as important as the ability to communicate and participate in a varied range of projects, preference is for a younger person possibly educated to degree level but this is by no means compulsory. SALARY will be attractive and will be combined with opportunities available in a rapidly developing section of the company.

REMEMBER

The above represents only a small selection of our requirements. If you are currently considering a change of employment then it might be wise to talk to us first regarding a range of vacancies throughout the U.K.

CONTACT

IAN BACON/NEIL PHILLIPS
COMBYTE SERVICES LTD.
Suite 74/76, 12/13 Henrietta Street, London WC2E 8LA
Phone: 01-240 3223/4

WEST LONDON SENIOR PROGRAMMER/ANALYST

We have been asked to find someone with a fair amount of RPG II and System 3 experience to act as Deputy D.P.M. and effectively run the department for a large amount of the time. In addition to at least 2 years' RPG II you will need a year's Analyst experience plus some supervisory experience, most of the work will involve development of new systems as an Analyst for a small company in the Leisure Industry. SALARY is around £5,000 p.a.

SOUTHERN ENGLAND COBOL

WE HAVE A CONTINUAL REQUIREMENT FOR PROGRAMMERS WITH 1-5 YEARS' COBOL EXPERIENCE ON ANY MACHINE. VACANCIES EXIST WITH USERS FROM ALL AREAS OF INDUSTRY AT LEVELS FROM JUNIOR PROGRAMMERS TO TEAM LEADER.

IF YOU ARE A COBOL PROGRAMMER CONSIDERING A CHANGE THEN WE SHOULD BE ONLY TOO HAPPY TO ADVISE YOU ON SOME OF THE POSITIONS OPEN TO YOU.

LONDON SENIOR PROGRAMMER/ANALYST

Ideally a graduate with a technical degree. Must have 4 years' IBM COBOL with a knowledge of MARK IV being advantageous. The position will be of interest to those earning up to £5,500 p.a.

WEST ESSEX ANALYST/PROGRAMMERS

We would like to find a number of people for our Manufacturing Client currently in the process of installing new Honeywell Hardware.

FIRSTLY

We need programmers with 12 months' COBOL or any MAINFRAME. You will be thought a great deal about the sophisticated systems currently being run and those also being developed potential to advance into other areas is really excellent.

SECONDLY

We need an Analyst with sound design and implementation experience on Financial and Production Systems at a Senior level, experience of Project Leadership would be an asset.

SALARIES for COBOL Programmers are in a range up to £5,000 p.a. and Analyst up to £6,000 p.a.

CONTRACTS

We are currently seeking personnel for a number of contracts, briefly detailed below. If you are currently available or expect to be in the near future we would like to hear from you:

PLI OS/DOS Essex
BASIC PLUS Essex
PDP CORAL Berks.
RPG II Various
Snr. CONSULTANT, PROCESS CONTROL COMMUNICATIONS, London
FORTRAN BACKGROUND London
BASIC ANY MINI Munich
(German Speaking)

IBM 3790 ASSEMBLER Analyst-UNIPAY EXP. London
15 PLAN/ASSEMBLER programmers, Long contract. Scotland
George 2/3 operators North and South

Mini Programmers

Mainframe Salesman

It could pay you
to pay us a visit

The next in the successful series of Square One get-togethers will be in our home town of Chesham. Come and talk to us over a beer and a sandwich, and discuss worthwhile opportunities in a company where skills and hard work really count.

Come at lunchtime or in the evening, whichever suits you best.

Mini Programmers: our immediate requirements are for experience in Fortran, Cobol or Basic. **Mainframe Salesman:** we need someone to cover London or the Home Counties. But we would like to meet computer professionals of all kinds.

We can promise you an informal but informative visit, and one which could change your life. Don't miss it. (Listen out for us on Capital Radio this weekend.)

One
Open Day

Monday November 21st 12 noon - 2pm or 5pm - 8pm
at The Limes, 130 High Street, Chesham, Bucks

If you can't make it this time, we shall be holding another London open evening at 150 Regent Street on December 5th.

Square One Computer Services Ltd 02405 74161

ALTERGO
COMPUTERS

We are searching for some talented imaginative and enterprising bodies in three specialist areas. You will be based in the Soho area of London and we need you to start at the earliest possible moment.

So far as salary is concerned we are prepared to offer the best if you can prove you've really got what we want.

SYSTEMS PROGRAMMERS

We want three Systems Programmers to support the DEC PDP-11 operating systems RSX11M and RSTS. Each person will have total control over an operating system with carte blanche within their arranged area. A real chance to get away from re-inventing the wheel. A knowledge of RT11 would be an added advantage.

SOFTWARE DEVELOPMENT

A Systems Programmer to take full control of software development on an INTEL-8080 based micro. Once again carte blanche is offered to a person who can demonstrate the necessary enterprise.

MACRO PROGRAMMERS

We are looking for six imaginative MACRO-11 programmers for entertaining projects work in all shapes and sizes. The only common factor being, as ever, we'd like it by yesterday.

altergo

Contact: Robert Smith
Altergo Computers
Limited
8 Dean Street
London, W1
Telephone: 01-734 5812

Senior Programmer

If you are an experienced programmer, and are ready to add supervisory experience to your career development, then you could be the person that we are seeking.

The team is at present engaged in developing a new pharmaceutical costing and production system using COBOL and I.B.M. equipment. Within our progressive computer department you would be working directly under the Project Leader at Buxton, with responsibility for the supervision and technical development of a group of programmers of varying experience.

This significant appointment requires a person with wide programming experience and the ambition to develop supervisory management skills.

The position offers a salary in line with the responsibility and a range of benefits including a contributory pension scheme, profit sharing scheme, staff discount facilities and assistance with relocation expenses where appropriate.

Ready for a position like this? Then please write for an application form to:

Mrs. G. K. Greenwood, Employment Officer,

The Boots Company Ltd.,
Head Office, Nottingham NG2 3AA.



CHELSEA COLLEGE
University of London

A SENIOR
COMPUTER
OPERATOR

is required for the College Computer Centre. The Centre is equipped with an ICL4130/PDP11 computer system providing a general batch/multiplex access terminal service. Access to the University CDC computers is additionally provided by a UT200 batch service.

Applicants should have a minimum of 5 years in Mathematics and English and at least two years' operations experience on mainframe machines. Salary in the range £3250-£3850 per annum (inclusive of London Allowance and Supplemental). A shift allowance of £145 p.a. is also paid for night shift.

Applications to the Secretary, Computer Centre, Chelsea College, Fulton Place, Fulham Broadway, London SW3 6PH. Telephone: 01-736 1244.

LONDON BOROUGH OF ENFIELD

A Person
to Specialise
in Software

£5,494-£6,055

Applications are invited for this post in the Borough Treasurer's Department. The successful applicant will be responsible for advising on and implementing software in addition to supervising programming work in the Borough's computer installation currently running on ICL 1902T and is developing a terminal system on ICL 1902T.

An application form is obtainable from the Borough Treasurer's Department, Borough of Enfield, 100, The Civic Centre, Silver Street, Enfield, Middlesex, EN1 1JF. Closing date the 2nd December 1977. Please send your application to the Borough Treasurer, Borough of Enfield, 100, The Civic Centre, Silver Street, Enfield, Middlesex, EN1 1JF.

MYRIAD
APPOINTMENTS
LIMITED

Computer Personnel Consultants

CHIEF PROGRAMMER

LONDON

£8000-£7500

We are currently recruiting for the position of Chief Programmer for our client in Central London.

The position offers senior programmers of analyst/programmers an opportunity to move into a management role whilst maintaining a fairly high degree of technical involvement.

Applications are invited from candidates who are able to offer sound COBOL programming experience on IBM hardware. You should feel confident enough to handle the running of a small programming department. Team leading experience would be an advantage but is not as important as management potential.

The salary for the position is negotiable but will not prove a problem area for the right person.

ASSEMBLER PROGRAMMERS

(DOS Systems Programming)

C. LONDON

c. £5000

This is an unusual opportunity to obtain a position as a SYSTEMS PROGRAMMER. Those selected will join the Systems Programming team immediately upon appointment and will receive full training in in-depth aspects of the operating system.

Successful applicants will progressively gain expertise in this specialist field. They can look forward to a stimulating and lucrative career in an IBM 370 environment.

The basic requirement is about two years ASSEMBLER gained in a DOS or DOS/VS installation. A genuine desire to move into this more technical area is essential, as an interest in advanced software considerations is as important as previous programming experience. The salary is negotiable dependent upon experience and all realistic applications will be considered on merit. The company is conveniently situated for all forms of London transport and for mainline stations.

SMALL SYSTEMS DESIGNER

Machine/Systems/Evaluation

BERKS.

£5500-£7500

This position presents an ideal opportunity for a person competent in both the technical and business issues involved with small systems to play an active part in developing new facets for small computers.

The successful candidate will carry out systems evaluation exercises and in addition to understanding the machinery will be familiar with the general range of business applications for which they are generally used.

Candidates should have implemented several systems on small computers and will probably be familiar with RPG II and Assembly level languages. A knowledge of IBM System 3 would be a distinct advantage, although applications are welcomed from people with experience of small Univac, Honeywell, Burroughs or ICL equipment.

The appointment is within a specialist team providing a hardware and software package evaluation service and is within a Company offering excellent conditions of employment.

SENIOR SYSTEMS ANALYST

BRENTFORD

c. £6000

A vacancy has arisen for an experienced Analyst, keen to work with on-line systems using TOTAL software. You will initially work on the specification of the system and go on to lead a team of Analysts and Programmers developing applications for both Accounts and Personnel Departments.

A background in either Operations or Programming, ideally using a Honeywell mainframe, would be an advantage; although experience of on-line systems would be equally useful.

The Company offers a pleasant working environment and a competitive salary; the opportunity of moving to a project management role within a year is also a real possibility.

Please telephone for a confidential
discussion or write to:
30 Fleet Street London EC4Y 1AA
01-353 5868

INTERNATIONAL SECURITY
PRINTING COMPANY

NEW MALDEN SURREY

We wish to extend the services provided by our ICL 2903 installation, and require the following additional staff:

Data
Processing Manager
£5400-£6500

Reporting to the Management Services Manager and working closely with user departments, the person appointed will be responsible for managing the Data Processing Department, developing the installation and introducing new systems. At least four years' experience is necessary in a senior computer operations position including project planning and control, systems design and report presentation. Knowledge of accounting routines would be an advantage.

Systems
Analyst/Programmer
£4700-£5600

Reporting to the Data Processing Manager, the person appointed will be required to lead and successfully complete a programme of projects to improve and develop the data processing systems and services within the Company. A good educational background and a minimum of two years' experience of systems analysis is required. Actual starting salaries will depend on individual qualities and experience, and will be supported by a substantial range of fringe benefits.

Please write or phone for an application form to:



The Personnel Office
BRADBURY WILKINSON &
COMPANY LIMITED
285 Burlington Road
New Malden, Surrey, KT3 4NH
Tel. 01-847 3271

ANGLIAN
D.P. SERVICES LTD
RECRUITMENT SERVICE

formerly ANGLIAN COMPUTER SERVICES

R.P.G. PROGRAMMERS

We have a number of Urgent Requirements for R.P.G. Programmers with 18 months' plus experience to work in Essex and Suffolk.

COBOL PROGRAMMERS

Numerous vacancies exist for Cobol Programmers with 1 year plus experience throughout East Anglia. Experience is required on IBM, ICL and Honeywell Mainframes.

All salaries are negotiable and are highly competitive.

Phone: Danbury 4255 (STD 024541)

Lines open 24 hours

or write ANGLIAN D.P. SERVICES LTD.

Stratford House, Maldon Road

Denbury, Chelmsford CM3 4QW



The Wine Society requires a

COMPUTER OPERATOR
(Single Shift)

For its ICL 2903 computer installation.

Previous operating experience essential, preferably on the above type of machine, also some knowledge of RPG would be an advantage.

Salary will be between £2,750-£3,000 depending on experience.

For further information please contact:

Mr. M. Scott
I.E.C. WINE SOCIETY
Gunpowder Road, Stevenage
Hertfordshire SG1 2BB
Telephone: Stevenage 4181

COMPUTER
PROGRAMMERS

are required to join a team based in Milton Keynes. The team will be responsible for the development and maintenance of a batch processing system. The successful candidate will have a minimum of 2 years' experience in the development and maintenance of batch processing systems. The salary is negotiable and will be commensurate with experience. Please send your application to: The Personnel Office, Bradbury Wilkinson & Company Limited, 285 Burlington Road, New Malden, Surrey, KT3 4NH. Tel: 01-847 3271.

CAPITAL APPTS.
GRADUATES

Urgently required for various positions: Industrial, Scientific, Commercial, Situations Salaries £3,000 ALL AREAS. Phone for full list of vacancies. 037 5557407, 036 9659 eve.

"ON THE MOVE"
SALARIES TO £5,400

You could really go places with our Birmingham based client, a major force within the public services field, who are currently seeking to augment their existing team to cope with a tremendously exciting expansion programme.

DO YOU MEET THEIR REQUIREMENTS?

SYSTEMS
PROGRAMMER

- * a minimum of 3 years COBOL and PLAN experience
- * thorough knowledge of GEORGE II
- * in-depth communications experience preferably including MAXIMOP
- * the ability to liaise with technical staff

CHIEF PROGRAMMER PROGRAMMERS

- * potential to manage a programming team
- * minimum of 3 years' COBOL experience, with a knowledge of PLAN an advantage
- * working knowledge of GEORGE II
- * knowledge of communications software, and ideally systems design experience
- * a minimum 9/12 months COBOL experience in a commercial environment
- * A knowledge of GEORGE II
- * Ideally, but not essentially knowledge of PLAN
- * a desire to gain KEY EDIT Programming experience

If you are looking to join a company offering genuine career prospects, excellent fringe benefits, relocation expenses and are confident that you can make a valuable contribution to their future development plans, which include a great deal of involvement in ON-LINE working, then contact without delay!

ANDY CARTER ON: 021-236 3781

REF. NO: CW/11/14

SPECIALIST COMPUTER RECRUITMENT LTD.

BIRMINGHAM 021-236 3781 FREEPOST
Freepost, Equity and Law House, 35-37 Great Charles Street, Cheltenham, Gloucestershire GL52 2BR

MANCHESTER 061-833 0676 FREEPOST

Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST

Freepost, 4, 102 Blandford Street, London W1E 1JZ



SCR

"IBM ASSEMBLER PROGRAMMERS" UNLEASH YOURSELVES

EAST MIDLANDS Salaries to £5k - Extensive Fringe Benefits
An unrivalled series of software products, currently being developed on-line, and an exciting planned expansion programme makes this a unique opportunity for IBM ASSEMBLER level Programmers to join our client's organisation and secure prime career opportunities.

TELE-PROCESSING SOFTWARE DEVELOPMENT

CANDIDATES SHOULD HAVE:-
★ a knowledge of IBM 370 series hardware combining experience of ASSEMBLER programming and teleprocessing techniques
★ a preparedness to develop your career and accept rapid promotion

SOFTWARE IMPLEMENTATION

CANDIDATES SHOULD HAVE:-
★ a knowledge of IBM 370 series hardware combining experience of ASSEMBLER level programming
★ a preparedness to travel, and develop your career and accept rapid promotion
All candidates should have the necessary qualities to work in close contact with clients.

OUR CLIENT OFFERS:-
A VARIED, STIMULATING WORKING ENVIRONMENT, OUTSTANDING OPPORTUNITIES FOR PERSONAL CAREER DEVELOPMENT, ONGOING TRAINING AND EXCEPTIONAL FRINGE BENEFITS.
These positions offer self-motivated Programmers an opportunity to accept immediate responsibility as Analyst/Programmers.

Interested candidates should contact without delay:-
REG HEATH 021-236 3781

SPECIALIST COMPUTER RECRUITMENT LTD.
BIRMINGHAM 021-236 3781 FREEPOST
Freepost, Equity and Law House, 35-37 Great Charles Street, Birmingham B3 2BR

MANCHESTER 061-833 0676 FREEPOST
Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST 6
Freepost 6, 102, Blandford Street, London W1E 1JZ

REF. NO. CW/11/18

SCA Computing
Services
Association

Manchester System Designers/ Programmers

- Standard Software Development
- There are vacancies at senior and intermediate levels for a number of System Designers and Programmers to join the highly successful team developing real-time standard software for the ARGUS 700 range of computers. These are attractive openings for competent professionals who are looking for technical challenge and advancement. Candidates should have at least two years' experience in the real-time field and successful applicants are likely to have a degree in computer science, mathematics or one of the physical sciences. Recent experience in any of the following areas of software would be an advantage:
 - Multi-access job control
 - Terminals, emulators and remote batch terminals
 - Alphanumeric and semi-graphic VDUs
 - Development of the BASIC programming language
 - Peripheral control
 - Standard utilities
 - Standard process control software

Customer Support
We are also seeking software support staff whose task is to help customers by correspondence, telephone and site visits to obtain the greatest benefit from their systems and to find the root cause of any software faults. We aim to provide software support of a very high quality and we give support staff the opportunity to develop the widest possible understanding of operating systems and languages. Successful applicants are likely to have at least three years' experience with real-time operating systems but a friendly, diplomatic manner and tenacity of purpose are at least as important.

FERRANTI LIMITED is a wholly British Company. We design and manufacture the ARGUS 700 range of computers and are European market leaders in supplying real-time industrial process control and on-line data communication systems. Being system suppliers as well as equipment manufacturers our staff are able to see projects as a whole and the interactions between hardware and software design are within their direct control. Professional development is encouraged. Competitive salary levels will be offered. Generous relocation allowances are available where appropriate. Our offices and laboratories are in a pleasant part of South Manchester, close to very good residential areas. Apply in the first instance to Mr. W. L. Robinson, Ferranti Limited, Simonsway, Wythenshawe, Manchester M22 5LA giving brief career details (quote reference SDP/CW).

Informal Interviews
If you would like an informal discussion on career prospects with Ferranti in any branch of computer system design, software, project engineering, sales or customer support, senior members of our staff will be happy to meet you at one of the following times and places:

MANCHESTER: Grand Hotel, Tuesday 22nd November, 4.30 p.m. to 8 p.m.
ALTRINCHAM: Cresta Court Hotel, Thursday 24th November, 4.30 p.m. to 8 p.m.
LIVERPOOL: Adelphi Hotel, Tuesday 29th November, 4.30 p.m. to 8 p.m.
STOKE-ON-TRENT: George Hotel, Burslem, Thursday 1st December, 4.30 p.m. to 8 p.m.

Don't make an appointment - just arrive
FERRANTI
Wythenshawe Division, Manchester.

Compex Computer Services Olney, Bucks.

Compex is an established company specialising in the development of commercial systems and standard packages based on both mainframe and sophisticated minicomputer hardware.
The steady expansion of the company's client base has created the need for additional D.P. professionals to complement the existing team.

PROJECT MANAGER

Salary c £5750 with bonus
This position will appeal to an experienced analyst/programmer who enjoys a high level of responsibility and a wide variety of interesting work.

The successful candidate will be involved in all aspects of systems development including feasibility study, pricing, project control and implementation.

PROGRAMMERS

Salary c £4300 plus overtime
Applications are invited from experienced programmers who have the ability to work in small teams with total systems involvement. This is an outstanding opportunity to work on several manufacturers' hardware using assembler languages, COBOL and other high level languages. The technically advanced environment will also include the use of both teleprocessing and database techniques.

For further details, phone Les King up to 8 p.m. or write to: Modern Computer Services, FREEPOST, London, SW11 6BR, 01-228 2283.

MODEM Consultants in Data Processing

JOBS IN THE MIDLANDS

Computer Weekly will once again on December 1st highlight job opportunities in the Midlands. To secure advertising space in this important feature contact:

Birmingham: Alan Escott 021-366 4838
London: Anne Wilson 01-261 6098

SENIOR SALES APPOINTMENTS £10,000 + CAR + MORTGAGE

Opportunities for £10,000 per year plus car and attractive mortgage scheme. Additionally, benefits include non-contributory pension scheme

Senior sales appointments:

We have been retained to recruit experienced sales executives for a well-known and respected company in the computer services industry. The opportunities arise from the company's plan to develop substantial new business based upon both conventional batch processing and comprehensive communications facilities.

Desirable experience for these appointments will include:

1. bureau software services.
2. mini computers/VRC/small business systems.
3. communications facilities.

These are exceptional opportunities for candidates seeking a successful career.

Please contact the Senior Consultant on 01-488 5644, quoting CW 182.



Insight Marketing & Personnel
Consultants Ltd.
72-75 Marylebone High Street
London W1M 4AJ
Telephone: 01-488 5644

SYSTEMS PROGRAMMER

The Military Aircraft Division of British Aircraft Corporation has a comprehensive range of high-technology products including the Jaguar and Tornado supersonic aircraft. Its computing facilities are commensurate with the sophistication and scale of these projects.

A Systems Programmer is required in the Commercial Data Processing Department to assist in the maintenance and development of the operating system and associated software.

Applicants should have two years' OS systems programming experience, with a good knowledge of Assembler. Further training will be given where necessary.

The installation comprises an IBM 370/158 (13 megabyte) operating under OS/VS1. VM has been generated to assist in operating system development.

The position offers the conditions of service appropriate to a major and progressive organisation. Relocation expenses may be payable to the successful applicant.

Please phone or write for an application form to:-

Chief Personnel Officer,
British Aircraft Corporation,
Military Aircraft Division,
Strand Road,
Preston, Lancs. PR1 8UD.
Tel: Preston 54722 Ext. 3

British Aircraft Corporation... a
BRITISH AEROSPACE
company



Sales Manager - Specialist Bureau Services

Based London EC1 to £7000 plus car

The job: to develop and effectively manage sales effort within a fast-growing specialist division of one of the U.K.'s leading computer bureaux offering both on-line and batch facilities. Career opportunities are excellent in this dynamic, professional group.

The person: a sales professional with a proven track record in the computer bureau field is an absolute essential. Preferably a senior sales executive with managerial ability, ambition, drive and determination who will build a small team of dedicated salesmen committed to continuing the rapid growth of this important sector of the company's activities.

If you think you fit the bill, show us by telephoning Pat McGowan on 01-242 0747 any time on Friday or Monday.

COMPUTING ASSIGNMENTS UK AND OVERSEAS PROGRAMMERS AND SYSTEMS DESIGNERS

EUROPE
We require applicants with experience of Airline Ticket Reservation and Cargo Handling Systems. Knowledge of Univas, IBM and ICL Mainframes is necessary. There will be opportunities to work in Scandinavia and the Middle East. Ref. MS 11/12

PROGRAMMERS AND CONSULTANTS

EUROPE
We are recruiting people with Mini Computer Real-Time Experience in Message Switching Communication Systems. Knowledge of PDP 11, RSX 11M Argus 300/500/700 Minis and Corel 68 and Assembler languages necessary. Vacancies exist in Scandinavia, Germany and U.K. Ref. MS 11/13

PROGRAMMERS, ANALYSTS AND SOFTWARE DESIGNERS

Excellent opportunities for candidates with Real Knowledge of ICL 1900/2801 4 New Range Hardware and Language ability using Cobol, Plan, Fortran, Algol, PL/I, Basic, Pascal and K and DME. Vacancies exist in the North, Midlands and Central London.

MICROPROCESSOR PERSONNEL

EUROPE
Candidates are needed with experience of Intel, Zilog, Motorola or Texas Instruments microprocessors with knowledge of Mathematical Modelling, Avionic Simulation Techniques and Signal Processing. Vacancies exist in Holland, Germany and U.K. with modern users and software houses. Salaries range from £3,000 to £15,000. Please write to: John Bailey, Mella Software (Pty) Ltd., Tel: 01-287 1805, 254 Easton Road, London NW11 2BD

MALLA TECHNICAL SOFTWARE LTD.
254 EASTON ROAD,
LONDON NW11 2BD
TEL: 01-287 1805
(A division of the Mella Technical Services Group established in 1970)

datascene

RECRUITMENT CONSULTANT (SYSTEMS AND PROGRAMMING)

£10,000

If success means anything to you, you can appreciate that Datascene's rapid rise to our current position in the 'top five' recruitment consultancies is a bit special.

So are our consultants. Because they are the people who have created this success and are currently enjoying the benefits it brings. Our rapid expansion has created the need for an outgoing person to join us as a Recruitment Consultant, to be responsible for Programmers and Analysts.

In a varied and fulfilling role, you will work closely with a client and consultancy staff on all aspects of recruitment, from job identification, through to advertising, interviewing and the presentation of a short list.

You should already have a proven track-record of success in this field. This, coupled with management potential and the ability to inspire confidence in both clients and applicants will reward you with a £10,000 p.a., made up of a high basic salary plus commission and profit share, and benefits which include free P.P.P.

This is your opportunity to flex your muscles in an expanding company. Discuss it further with Mike Dauncey of Martin Grayson.

01-439 1856
24-hour answering service
Datascene Limited
Sceptre House
169-178 Regent Street
London W1R 7FB

Software Quality Assurance

A multi-national data processing company with a base in Scotland is actively involved in the development of a wide range of progressive software applications. The company has taken significant steps forward in quality assurance and now wishes to make two senior appointments in this area. One of the men or women appointed will head up an energetic project team, while the other, as part of this quality assurance team, will be actively involved in its problem-solving role.

The main responsibilities will be to provide functional direction, technical guidance and co-ordination to a team of programmers engaged in the evaluation of new software projects. Requisite experience for these posts will have been gained over a period of 5 years in software development of computer operating systems. Additionally

some knowledge is required of the techniques involved in evaluating and testing, to detailed standards, of software products. To ensure that the correct calibre of people are appointed, the company offers an extremely attractive remuneration package with the salary level being determined by the experience of those selected. Other conditions include a 35 hour week, pension and life assurance schemes and generous relocation assistance to this high amenity area of Scotland. (Ref: E5708/CW)

REPLIES will be forwarded direct unopened and in confidence to the client unless addressed to our Security Manager listing companies to which they may not be sent. They should include comprehensive career details, not refer to previous correspondence with PA and quote the reference on the envelope.

PA Advertising

127 George Street, Edinburgh, EH2 4JN. Telephone: 031-225 4481



A member of PA International

Experienced Honeywell Operators

c.£4,000+overtime

Whitbread, one of Europe's largest and most successful brewing groups is stepping up the computerisation of a wide range of functions at its Computer Centre in Britannia Street near Kings Cross.

We are currently developing a series of sophisticated systems and we need resourceful men and women to help us implement them and subsequently maximise their efficient utilisation. As long as you have the necessary initiative and drive there is great scope for career progression in this challenging and rapidly developing environment.

You will ideally have experience with GCOS 20UX1 or GCOS, and a knowledge of Honeywell level 64s would be a distinct advantage.

The actual starting salary (inclusive of shift allowance) will depend on experience and will be supported by a substantial range of benefits including free lunches.

If you are looking for a job now or for the New Year, then please telephone Pat Donnelly for an application form, or write to her giving brief personal career details at Whitbread & Co. Ltd., Chiswell Street, London EC1Y 4SD. Tel: 01-606 4455.

WHITBREAD



SYSTEMS PROGRAMMERS ANALYST/PROGRAMMERS

SALARY £4,500 to £7,500 p.a.
with additional benefit

Alimand Management Services Ltd. have specialised with an acknowledged degree of success in Mini-Computer applications currently concentrated in the banking and financial sectors.

Following sure and steady expansion we are currently recruiting efficient and mature personnel to fill interesting and demanding assignments in the UK and the Americas. There are a range of opportunities from one year's experience upward, with details of experience to: Alimand Management Services Ltd., 250 Brompton Road, London SW3 2AT

Computer Operator

A vacancy has become available in our Financial Accounts Department, to assist the Computer Operations Supervisor.

The successful applicant, aged 22 or over, will have had one year's' experience, preferably including NIXDORF equipment, and will have a responsible outlook to his/her work.

The main duty will be to correctly process daily work schedule as supplied. Basic hours of duty will be from 12 noon to 8 pm, Monday to Friday, which will require an ability to work on own initiative.

A good starting salary will be negotiated, together with the usual fringe benefits associated with a large company.

Please write with full details to: Mrs. S. Parker, Charrington and Company, Anchor Brewery, Mile End, London E.C.1. Telephone Number 01-790 1860.



Charrington

SOCIAL SCIENCE RESEARCH COUNCIL

JUNIOR COMPUTING FELLOWSHIP

The SSCRC is able to offer a Fellowship for a three year period, at a scale analogous to that of Scientific Officer grade (2593-4048 p.a.) to enable suitably qualified graduates to work on the SSCRC 4070 project. The appointment is intended to provide advisory and support services for the SSCRC 4070 project. The SSCRC 4070 project is a major project being mounted and based on the GC 4070 at the SSCRC Rutherford Laboratory, near Chilton, Didcot, Oxfordshire, and the Fellow will be required to assist with this work until Spring 1978, when the machine will be moved to a university or polytechnic site. The Fellowship will be required to move to the new site, which will be selected later this year.

Applications are invited from graduates who could contribute both to the provision of the Statistical Package for the Social Sciences (SPSS) service on the GC 4070, and to advising social science users on statistical and data analysis problems. Further details and application forms are available from:

Mike Wood, SSCRC, 1 Temple Avenue, London EC4Y 0BD.
Telephone 01-383 6255, ext. 57.
Please quote ref: CF/CW. Closing date for applications: 8 December, 1977.

SELL, MARKET, SUPPORT THE SYSTEMS OF THE FUTURE TODAY!

We are recruiting for a truly exciting U.S. and Internationally based mini computer supplier, whose products are taking the commercial, industrial and OEM market places by storm. Their products are in the very forefront of computer technology, and they have today what many of their competitors talk of having tomorrow.

MINI COMPUTER SALES ENGINEERS

Base Salary: circa £6,500 on quota earnings
circa £10,000 plus 2 litre car, plus profit sharing

Opportunities exist for two professional salesmen with proven track records in the mini computer market place. Ideally candidates living within a fifty mile radius of Manchester or Bedford are required. However generous relocation expenses will be paid to suitable applicants. Responsibilities will include management of existing accounts and the development of new business, in this exciting and fast moving market place. Excellent state of the art products for wide ranging applications are available, backed by excellent technical support.

TECHNICAL SUPPORT ENGINEERS

Salary to £6,500 plus profit sharing

Our clients require three technical support engineers to provide technical know-how to the rapidly expanding U.K. and International market place. Candidates should be well versed in mini computer software and hardware, and should possess the communicative skills necessary to give high-level presentations to customers, discuss software capabilities, and provide consultancy services to the user base. Applicants should have a good grounding in mini-computer operating systems and have experience on one or more of the following languages: COBOL, FORTRAN or BASIC.

Candidates for all the above positions should be ideally aged between 25-35, and be educated to HNC/Degree standard. Our clients offer above average terms and conditions of employment, including relocation package, pension scheme, non-contributory life assurance and private patients plan. Initial interviews will be held in Manchester, Birmingham and London.

CONTACT: DAVID WADE ON 061-833 0676.

REF. NO. CW/11/1.

SPECIALIST COMPUTER RECRUITMENT LTD.
BIRMINGHAM 021-236 3781 **FREEPOST**
Freeport, Equiway and Law House, 35-37 Great Charles Street, Birmingham B3 2BR
MANCHESTER 061-833 0676 **FREEPOST**
Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD
LONDON 01-935 0671 **FREEPOST**
Freeport 6, 102, Blandford Street, London W1E 1JZ

SCR  Computing Services Association

DATA TERMINAL SALES ENGINEER

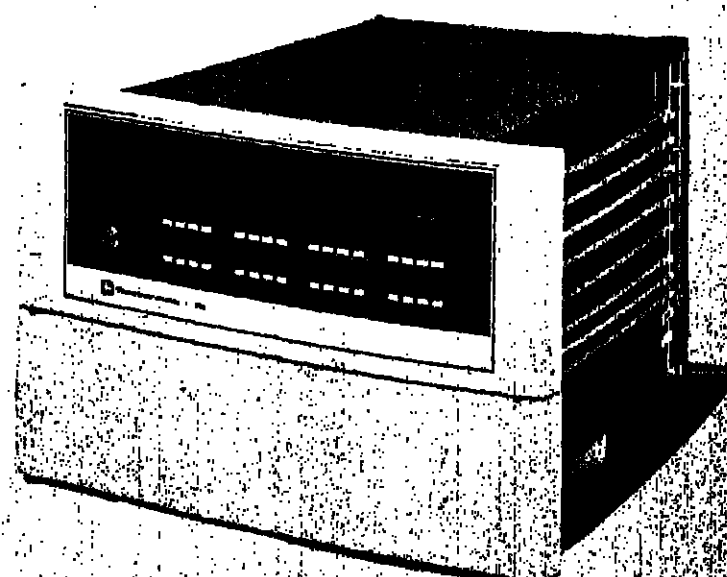
Base Salary circa £5,500, on quota earnings
circa £8,000 plus 2 litre car, plus profit sharing

For this position our clients require a professional salesman with a proven track record in this fast moving, high volume sector of the market. Our clients offer a comprehensive range of intelligent and non-intelligent devices, utilising some of the most advanced technology available. Location for this position—ideally within daily travelling distance of Slough, although generous relocation expenses will be paid, where necessary.

PRODUCT MARKETING ENGINEER

Salary to £6,500 plus profit sharing

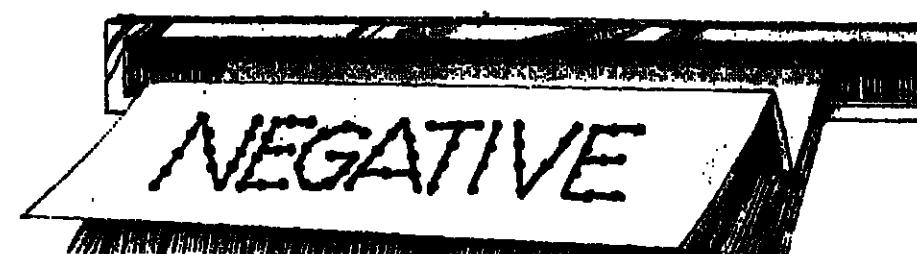
These are out-of-the-ordinary opportunities for technical or sales people to move into a true product marketing role. You will need to be technically qualified to HNC or Degree level, and have a minimum of two years mini-computer experience. Responsibilities will include market research and analysis, product specification, merchandising and sales strategy. The production of quotations and proposals from a technical and profitability viewpoint, will be required.



SIEMENS

Senior Systems Programmers £12,500-£16,000

Are you a highly qualified
D.P. Professional being
held back by your computer?



Why not take a positive step and join a major worldwide organisation in the field of electronics and electrical engineering with a business volume of £5,000 million +.

The Siemens Data Systems Group in the last 20 years has established itself as a leading European Manufacturer of computers and computer peripherals. Our computer activities are undergoing substantial expansion, with a present annual turnover of £300 million.

For our systems software development teams we are looking for approximately 15 highly qualified professional men or women who are interested in further developing their DP skills in an environment with excellent technical facilities and extensive financial resources.

TO WORK IN WEST GERMANY OR BELGIUM IN THE FOLLOWING FIELDS:

Development of Operating Systems —

for all phases of operation systems development from design to implementation and tests. Based in Munich or Namur.

Teleprocessing Software —

for the development, test and performance measurement of systems software for Data Communications Systems involving: computer networks, virtual terminals, data communication access methods, communications protocol and transaction systems. Based in Munich.

Systems Integration and Test —

to integrate large operating systems and associated products including functional stability, regression and performance testing. Based in Munich.

Ideally all candidates will have the following background: more than five years' DP experience with a minimum of three years in at least one of the aforementioned fields. A science Degree and knowledge of German or French would be an advantage but not essential.

Relocation costs will be paid.

For application forms and further information, please contact: Ray Parker, Personnel Department, Siemens Ltd., Siemens House, Windmill Road, Sunbury-on-Thames, Middlesex. Tel: Sunbury-on-Thames 85691.

HERTS AND NORTH LONDON

We specialise in D.P. recruitment for clients in Herts and North London and the following vacancies are taken from our current register:

BOREHAMWOOD

Possibly the ideal installation — not too large nor too small, IBM based, informal, friendly but very professional. The vacancies are for a Programmer (c. £4,000) with 1 years' Cobol experience and an Analyst (c. £5,000) to join a department of ten engaged in the development of both batch and Real Time Systems. Although applicants must have worked in a commercial environment neither IBM nor Real-Time knowledge is necessary.

STANMORE

Centred around an IBM 370/125 and 2 Ventek minis using on-line VDU's for Stock Recording, our client has a vacancy for a Systems Analyst to make up a team of three shortly to begin development of financial real-time VDU systems. Commercial IBM experience is a basic requirement — real-time training will be given where necessary (up to £5,750).

MARYLEBONE

An opportunity to move into Systems/Programming — our client has vacancies for two experienced DOS/VSE programmers (up to £5,000) with a good knowledge of Assembler to join their IBM 370/145 installation conveniently located by Baker Street tube station. Naturally some knowledge of Systems/Programming would be preferred but otherwise full training will be given.

CHESHUNT

Situated just north of Enfield a highly developed ICL-based organisation currently has vacancies for Software Analysts with experience in COBOL and Plan (up to £5,500) and Commercial Analysts and Senior Programmers (up to £5,000). The installation is known for its first-class working conditions and liberal attitude towards career progression.

CITY, E.C.1

Small IBM System 3 R.P.G.II installation, shortly to include a Univac 9025, is seeking an Analyst/Programmer (up to £5,000). Parks include free meals in a first-class restaurant plus interest-free season ticket loans.

LUTON

Small department of 2 Analysts and 3 Programmers has a vacancy for an Analyst/Programmer with PDP Basic experience to assist a Project Leader in the investigation, design and development of Order Entry/invoicing systems in addition to being responsible for the supervision and guidance of the Programmers within the team (up to £4,750).

For more information ring:
**HAYMARKET
COMPUTING LTD.**
Tel: Cuffley (Herts.) 4130
up to 7.00 p.m.



UNIVERSITY OF ABERDEEN COMPUTING CENTRE

PROGRAMMING ADVISER

Invitations are invited for the above post within mathematical and scientific advising group. Applicants should have a good honours degree in mathematics or a science subject together with appropriate experience of programming in Fortran or another scientific language. A knowledge of statistical methods would be an advantage.

Salary on scale £3333-£5627 p.a. (under review) with appropriate initial phasing.

Further particulars from the Secretary, The University of Aberdeen, with whom applications (2 copies) should be lodged by 12th December, 1977. (Telephone 0224 40241, extn. Old Aberdeen 5363 for details.)

WEBSEX REGIONAL HEALTH AUTHORITY

DATA PREPARATION TEAM LEADER

required for our Computer Centre at Watford, Westchester. Applicants are invited from suitably qualified and experienced persons to be responsible to the Data Preparation Supervisor for a small team of Key Entry Operators. Candidates should, ideally, be experienced in Key to Disk.

Good working conditions and career opportunities are available. Salary Scale Supplement 1, £2,520 rising to £3,055, inclusive of allowances.

Job Description and Application forms, available from the Personnel Department, Higher Education Research Institute, Telephone Watford 8911, extn. 390/471.

Closing date: 25th November 1977

Senior Systems Analyst HARROGATE

An additional post of Senior Systems Analyst has been created in the Computer Branch of CEBB North Eastern Region as part of the planned expansion to fulfil the Region's increasing dependence on data processing. The Branch is responsible for computing development and production work on the Regional mainframe computer, and also bears functional responsibility for all the twin 370/168 installation at Board Headquarters in London.

Plans are now in hand to replace the ICL 1804S mainframe computer by a current generation system, which will be capable of supporting remote terminals throughout the Region, and interconnect with the existing National network of ICL 7905s. A controlled growth of distributed computing at the larger power stations is foreseen, in which Systems Analysts will be closely involved.

The main area of activity for the successful applicant, will be the development of DP systems for all aspects of power station management, with a particular emphasis on control on maintenance work, to maximise reliability of plant. The importance of this is indicated by the additional cost of supplying demand, when a large modern generating set is out of service; the amount currently ranges from £50,000 to £100,000 per day for coal fired plant, and over £150,000 per day for nuclear plant.

Applicants should have a degree or professional qualifications, and extensive experience of systems analysis and design.

The salary will be within a range of £5,500 to £8,950 per annum with possible progression to £7,550 per annum subject to a review.

Point of entry will depend upon experience, qualifications and training.

Applications in writing, giving details of age, experience, qualifications, present position and salary should be forwarded to the Regional Personnel Manager Central Electricity Generating Board, North Eastern Region, P.O. Box 177, Merion Centre, Leeds LS1 1RL, to arrive not later than Wednesday 30 November 1977 quoting reference SVN/723C.



The Research and Statistics Group of the Inner London Education Authority

Senior Programmer (Professional B)

to work on a number of applications in the field of education statistics

Applicants must have had a minimum of two years' experience of FORTRAN programming preferably in an IBM 360/370 environment, and should be accustomed to handling large and complex databases. Acquaintance with CRJE and SPSS would be an advantage.

The successful candidate will be expected to provide assistance and advice to less experienced staff, and will need to be able to communicate with researchers, statisticians and administrators.

Salary Scale £4,442.80 - £8,068.80 (inclusive of London Weighting and Phase 1 and 2 Supplements).

Details and application forms from the Education Officer (EO/Enab. 2A/1), Room 3B7, County Hall, London, S.E.1 7PB. Please enclose a stamped addressed envelope. Forms to be returned by 5 December, 1977.



Anglian Water Authority

HEADQUARTERS — FINANCE
DEPARTMENT
Ref. F1A/30 (Post No. H3C020)

SENIOR AUDITOR

Grade 8 — £5,731-£9,142

This is a new post related to the installation of the Authority's dual Honeywell 68/10 384K Computer which will be linked via a twenty-two line network with over seventy terminals throughout the Authority's region and also to the introduction of the Authority's direct billing system. The person appointed will work with the Computer Auditor and should be a member of a recognised accountancy body with experience of working in a large data-processing environment. This is an exciting opportunity to become involved in the development of new computer-aided audit techniques. Audit has its own dedicated terminal system and high level access to the data-base. This post forms part of the Headquarters computer audit team.

This post is located at the new Brook House, Huntingdon office and computer centre with first class working conditions. Generous relocation expenses are paid in appropriate cases.

NJC for Water Service, Staff Conditions of Service apply and the post is superannuable.

Job description and application forms (to be returned by 1st December, 1977) are obtainable from the address below. For further information telephone: Grams, Chief Internal Auditor, on Huntingdon (0480) 68181.

Personnel Department
ANGLIAN WATER AUTHORITY
Brook House, Bedford Way
Huntingdon, Cambs. PE1 8NZ

THE SALES BIT

Curse of the annual budget

THE curse of the computer industry is the annual budget syndrome. One could easily gain the impression that nothing existed before January 1 this year nor will have any relevance after December 31.

It's all very well setting short-term objectives for companies and salesmen, but in an industry and technology moving as fast as ours, one cannot leave tomorrow to look after itself.

This is particularly relevant when it comes to training in general and sales training in particular.

The managing director of one of our associate companies said to me recently, "If 40 competent salesmen walked into my office right now, I could have them all re-employed by teatime." Such is the shortage of good salesmen. And why?—because the industry, by and large, is not growing them.

And why are they not being grown? — because the "learning-curve" makes it difficult for a trainee salesman to make a significant contribution of new business within the time frame of the one-year budget in which his employment commenced.

Therefore, it appears that a better return in a shorter time can be attained by recruiting experienced professional salesmen, who can apparently commence effective selling from day one. In other words steal somebody else's!

This incestuous situation is both inefficient and unnecessary; if only computer companies would invest in producing their own salesmen at the trainee level within the context of a longer term investment, controlled perhaps within a parallel "moving budget".

There are many good people who would leap at the chance of entering the sales profession and could well be very successful. They could be experienced salesmen who do not currently have direct involvement with computers, or people who know about the application of computers and need to learn the basic skills of selling. Right now most computer companies have no interest in such recruits.

So, until we get everyone on three/five year "moving budgets" with annual sub-sets, it is likely that companies will overlook sales trainees and rely instead on the vagaries of recruiting salesmen from their competitors who are unlikely to ever have the loyalty and enthusiasm for the company that is typical of the home grown variety.

What a way to run a business!

TRADER

Puzzle answer

THE only solution to 7628
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